With Kindest regards
from M. A. Stein

A JOURNEY OF GEOGRAPHICAL AND ARCHÆOLOGICAL EXPLORATION IN CHINESE TURKESTAN.

BY

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INDIAN EDUCATIONAL SERVICE.

(*From 'The Geographical Journal' for December*, 1902.)

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In June, 1900, the Government of India placed me on a year's special duty in order to enable me to carry out a long-cherished plan of archæological explorations in the southern portion of Chinese Turkestan, and particularly in the region of Khotan. Many previous antiquarian tours in Kashmir, the Punjab, and on the fascinating ground of the North-West Frontier of India, had taught me the necessity of close topographical observation as an important adjunct of historical research in those fields towards which, as an Indian archæologist, I felt most attracted. It was hence clear to me that the task awaiting me in Chinese Turkestan would have to comprise also surveying operations such as are required for the accurate fixing of the position of ancient sites, and generally for the elucidation of the historical topography of the country. But in addition I was anxious from the first to avail myself of the opportunities the journey might offer for geographical work of a more general character in regions that had so far remained without a proper survey or altogether unexplored.

The generous aid accorded to me by the Indian Survey Department made it possible to carry on a continuous system of surveys, by plane-table, astronomical observations and triangulation, throughout the course of my journey. Its results have been embodied in maps which are shortly to be published by the Trigonometrical Branch of the Survey of India. These maps, as well as the Detailed Report of my explorations on which I am at present engaged under the orders of the Indian Government, will, I hope, show that I have spared no efforts to utilize the opportunities offered to me in the interest of geographical science. In the mean time, it is a source of sincere gratification to me that I am

* Read at the Royal Geographical Society, June 16, 1902. Map, p. 36.

enabled, by the courtesy of your Council, to place this succinct account of my journey and labours before the Royal Geographical Society, which, since the days of those great scholars, Sir Henry Rawlinson and Sir Henry Yule, has done so much to clear the way for the critical study of the ancient geography of India and Central Asia.

The plan of archæological explorations about Khotan, and of the journey that was to lead to them, was first suggested to me in the spring, 1897, by a series of remarkable antiquarian acquisitions from that region. Among the papers left behind by that distinguished but ill-fated French traveller, M. Dutreuil de Rhins, there were found fragments of ancient birch-bark leaves, which had been acquired in the vicinity of Khotan, and which proved to contain a Buddhist text in an early Indian script and language. On publication they were soon recognized as the oldest then known Indian manuscript, going back to the first centuries of our era. About the same time the "British collection of Central-Asian antiquities," which had been formed at Calcutta with the assistance of the Government of India in the Foreign Department, and under the care of Dr. Hoernle, the eminent Indologist, received from the same region very notable additions consisting of manuscripts, ancient pottery, and other remains. These objects had been sold to the political representatives of the Indian Government in Kashgar, Kashmir, and Ladak as finds made by native "treasure seekers" at ancient sites near Khotan and in the neighbouring portions of the Taklamakan desert. A curious feature of these acquisitions was that, besides undoubtedly ancient documents in Indian and Chinese characters, they contained a large proportion of manuscripts and "blockprints" in a surprising variety of entirely unknown scripts. While the materials thus accumulated, no reliable information was ever forthcoming as to the exact origin of the finds or the character of the ruined sites which were supposed to have furnished them.

No part of Chinese Turkestan had as yet been explored from an archæological point of view, and, however much attention these discoveries attracted among competent European Orientalists, it was evident that their full value for the ancient history and culture of Central Asia could never be realized without accurate researches on the spot. The practicable nature of such investigations was proved by the memorable march which Dr. Sven Hedin had made in the winter 1895–96 through the Taklamakan desert north-east of Khotan, and of which the first accounts reached me in 1898. It had taken the famous Swedish explorer past two areas of sand-buried ruins, and, though his necessarily short halt at each had not permitted of any exact evidence being secured as to the character and date of the ruins, this discovery amply sufficed to demonstrate both the existence and comparative accessibility of ancient sites likely to reward excavation.

In the summer of 1898 I was able to submit the detailed project of

my journey to the Indian Government, whose sanction and assistance were indispensable for the practical execution of my plan. Generously supported first by the Hon. Sir Mackworth Young, late Lieut.-Governor of the Punjab, and subsequently, on my temporary transfer to Bengal, by the Hon. Sir John Woodburn, my proposals met with favourable consideration on the part of the Supreme Government. According to the final scheme, which in July, 1899, received the sanction of the Government of India in the Department of Revenue and Agriculture, I was deputed on special duty to Chinese Turkestan for the period of one year, and was allowed a grant of £600 (Rs. 9000), intended to meet the estimated expenditure on the journey and explorations. It was solely through the consideration and material aid thus liberally accorded to me that I was able to undertake and carry to a successful issue the scientific enterprise I had planned. I therefore feel it my duty publicly to record here my deep sense of gratitude to the Government of India, which, under His Excellency the present Viceroy, Lord Curzon, have never failed to encourage and support researches bearing on ancient India and the regions that once belonged to the sphere of its cultural influence.

The practical preparations for the journey, which occupied much of my time and attention during the winter 1899-1900, were greatly facilitated by the liberal assistance accorded to me by Colonel St. George Gore, Surveyor-General of India. With a view to the proposed geographical work, he kindly agreed to depute with me one of the native sub-surveyors of his department, and to provide the necessary equipment of surveying instruments, together with a special grant intended to cover the additional expenses arising from the employment of the sub-surveyor. Babu Ram Singh, the sub-surveyor selected, had accompanied Captain Deasy during the latter part of his recent explorations in Chinese Turkestan, and the local experience thus acquired by him made his services particularly useful for the purposes of my own journey. Among my personal preparations, I may mention the study of Eastern Turki, the language of Chinese Turkestan. I was able to acquire a fair practical knowledge of it while still in India, with the help of a Kokandi servant, honest Mirza Alim, whom I had engaged at Peshawar, and who subsequently followed me to Kashgar.

By the middle of April, 1900, I was at last able to leave steamy and over-civilized Calcutta for Kashmir, where I completed the outfit and transport arrangements needed for my camp. The many tours I had made during previous years through the mountains in and about Kashmir had furnished me with sufficient practical experience to enable me to anticipate with fair accuracy the conditions of transport and supplies on a great part of the travels before me. The Government of India had granted me permission to use the route through Gilgit and Hunza for the journey to Kashgar, which was to form my proximate

goal. By the end of May the snow on the mountain ranges between Kashmir and Gilgit had melted sufficiently to make the attempt of crossing the passes with laden animals just practicable. By that time, too, the sub-surveyor's little party, and another Turki servant sent by Mr. Macartney, the British political agent in Kashgar, had joined me, and all requisite stores and equipment had been duly collected and packed. Owing to the quantity of scientific instruments, photographic glass plates, etc., to be carried, and to the provision that had to be made for stores of all kinds in view of the distances likely to separate us thereafter from civilized "bases of supply," my caravan numbered sixteen baggage animals when it set out on the morning of the 31st May from Bandipur, the little port on the Volur lake and the starting-point of the "Gilgit Transport Road."

Though the snow still lay deep and the weather was trying, the Tragbal and Burzil passes (approximately 12,000 and 13,000 feet above the sea, respectively) were crossed without mishap. Pushing on by rapid marches through the Dard valleys of Astor, imposing in their barren grandeur, and across the rock-bound bed of the Indus near Bunji, we reached the Gilgit cantonment on June 11. Fresh transport arrangements necessitated a short halt at this last outpost of Anglo-Indian civilization. Thanks to the kind offices of Captain J. Manners Smith, V.C., C.I.E., then Political Agent, Gilgit, I was there able not only to make good various small defects in the equipment of my caravan, but also to collect interesting information concerning the customs and traditions of the Dard population inhabiting these valleys. The Dards deserve, indeed, to be treated with respect by the historical student and ethnographist; for their tribes have clung to this forbidding ground of bleak rocky gorges and ice-crowned ranges ever since the days of Herodotos. Ancient, like the mountains themselves, looks the race, with its sharply defined ethnic characteristics and language.

On June 15 I started from Gilgit filled with a grateful recollection of the kind help and hospitality which I had enjoyed among the last British officers I was to see for some time. Marching round the mighty buttresses of Mount Rakiposhi (with its highest needle-like peak soaring to an elevation of over 25,000 feet) and through mountain scenery that under a sky of dazzling clearness looked as grand as any I have ever seen in the Himalaya, we passed on the third day into the territory of the chiefs of Hunza and Nagir. Close to the hill-fort of Nilth, famous for the brilliant little campaign of 1891, I visited with interest the deep-cut gorge descending from a glacier of Rakiposhi, where Captain Manners Smith climbed the most precipitous cliffs with his handful of Gurkhas and Dogras, and finally breaking the resistance of the Kanjuti hillmen, won his Victoria Cross. It was pleasant to note that the brave mountaineers who were vanquished here look back upon this daring exploit of their quondam foe and conqueror with almost as much pride as if it had been

performed by their own side. A short distance higher up the valley, near the village of Thol, I noticed a well-preserved little Stupa, a monument of those early centuries when this secluded valley, like the rest of the difficult hill-tracts further west, held a population attached to Buddha's faith. Was it the same small Kanjuti race, puzzling by its complete isolation in regard to language and ethnic origin, which now occupies Hunza?

At Aliabad, near the capital of the Hunza chief, I spent two days busily occupied with the rearrangement of all loads for transport by coolies; for the difficult mountain tracks by which alone the Tagh-dumbash Pamir can be approached during the summer months, from the side of Hunza, are absolutely impassable for any beast of burden. Acting on the instructions kindly sent in advance by the Political Agent, Gilgit, Wazir Humayun, the energetic chief adviser of Muhammad Nazim, the present Mir of Hunza, had made ample preparations for the trying route ahead. It was difficult to realize that this little mountain chieftainship was, until ten years ago, by reason of the freebooting and slave-raiding expeditions which it sent forth—and Wazir Humayun himself had led more than one successful raid of this kind—the terror of all neighbouring regions.

On June 20 I moved my camp to Baltit, where I paid a return visit to the Mir, in his old and highly picturesque castle. I was interested to note, in the carved woodwork of mosques and other structures, decorative elements of ancient Indian type, while in the furniture and fittings of the Mir's residence modern Central-Asian and Chinese influences were plainly discernible. On the following day we commenced on foot the series of trying marches up the gorge of the Hunza river. The winter route, which crosses the river-bed at frequent intervals, had become wholly impracticable, owing to the melting snows and the swollen state of the river. The precipitous mountain spurs and the great glaciers descending to the left bank of the river had daily to be crossed by tracks which may rightly be described as a succession of Alpine climbing tours of a decidedly tiring nature. They often led over narrow rock-ledges and by rough ladder-like galleries (*rafīk*) along the faces of cliffs, where the carrying of loads would be nervous work for any but such extraordinarily sure-footed and active hillmen as the people of Hunza. Frequent enough were the places where even my little fox-terrier, accustomed to rough climbs from many a tour with his master, had to be picked up and carried.

Toiling along these precipices, amidst scenery truly inspiring in its rugged splendour, I was often reminded of the vivid accounts which Fa-hien and other ancient Buddhist pilgrims from China have left us of their experiences on the journey through the gorges of the Indus. From Ghulmit, the second stage onwards, the scanty settlers occupying the few patches of cultivated ground in the valley

proved to be of Iranian origin, speaking a Wakhi dialect closely allied to that which is used by the Wakhan immigrants found in Sarikol. Thus, in this part of the Hindukush, too, the line of contact between the great areas of the Indian and Iranian families of language does not completely coincide with the geographical watershed.

After six days spent in more or less continuous climbing, Misgar, the northernmost hamlet of Hunza, was reached, where I was able to discharge the hardy hillmen who had carried our *impedimenta* without the slightest damage over such trying ground. On June 28, at last I crossed by the Kilik pass (*circ.* 15,800 feet above the sea) into Chinese territory on the Taghdumbash Pamir, using the Yaks of the Sarikoli herdsmen, who, by Mr. Macartney's arrangement with the Chinese authorities, had awaited me at the southern foot of the pass.

From Köktörök, our first camp on the Taghdumbash, at an elevation of over 14,000 feet, we commenced our plane-table survey, on the scale of 8 miles to the inch. Throughout our travels in the mountains I endeavoured to supplement it as far as my limited time permitted, by photogrammetric work, for which I used the excellent Bridges-Lee photo-theodolite kindly lent to me by Mr. Eliot, the head of the Indian Meteorological Department. Systematic triangulation by theodolite was started at the same time with the help of the points supplied by the Surveys of the Boundary Commission and Captain Deasy, while regular astronomical observations for latitude were made by Babu Ram Singh from here onwards at all camps, the exact determination of which possessed topographical interest. The constant and direct supervision which I exercised over the plane-table work, enabled me to pay special attention to the local nomenclature. A good deal of philological and historical interest attaches to the latter in regions like the Pamirs and a considerable portion of Chinese Turkestan, over which have passed the waves of great ethnic migrations. I believe, therefore, students interested in this part of Central-Asian geography will derive some advantage from the pains I took to correctly ascertain and to record with phonetic accuracy all local names throughout the territories covered by our surveys.

From the height of the Khushbel peak, the first "hill-station" of our survey (close on 17,000 feet above the sea), I could simultaneously see the ranges which form the watershed between the drainage areas of the Indus, the Oxus, and the Yarkand river, and which politically divide the territories of British India, Russia, and China, Afghanistan (Fig. 1). Pressed for time as I necessarily was in regard to all that touched my topographical interests, I could not resist the temptation of pushing westwards, at least as far as the Wakhjir pass, which leads from the Taghdumbash Pamir to the headwaters of the Oxus. Camping close to the summit of the Wakhjir pass (*circ.* 16,200 feet), I visited on July 2 the head of the Ab-i Panja valley, near the great glaciers which Lord Curzon

first demonstrated to be the true source of the river Oxus. It was a strange sensation for me in this desolate mountain waste to know that I stood at last at the eastern threshold of that distant region, including Bactria and the Upper Oxus valley, which, as a field of exploration, has attracted me ever since I was a boy. It was the threshold only I had reached, and I knew that this time there was no entrance for me into the forbidden land. Notwithstanding its great elevation, the Wakhjir pass and its approaches, both from the west and east, are comparatively easy. Comparing the topographical features with the

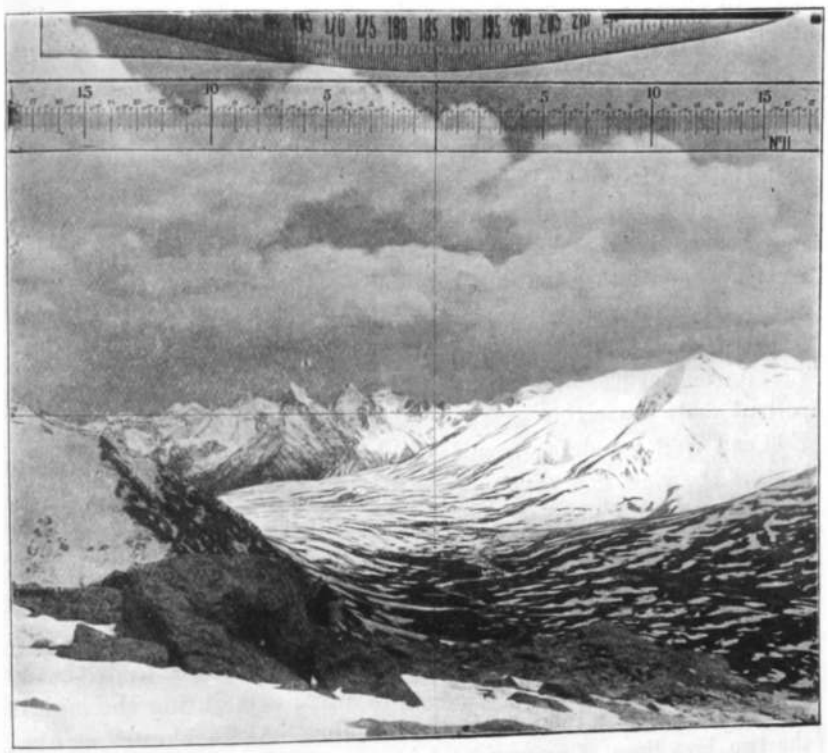

FIG. 1.—PHOTO-THEODOLITE VIEW OF KILIK PASS, FROM KHUSHBEL PEAK.

itinerary indicated by Hiuen Tsiang, the great Chinese pilgrim, I am led to conclude that the route which he followed when travelling about A.D. 649, on his return from India, through the valley of Pa-mi-lo (Pamir) into Sarikol, actually traversed this pass.

As I marched down the gradually widening valley of the Taghdumbash Pamir towards Tashkurghan, the chief place of the Sarikol district, I fully realized the contrast which its expanses of comparatively rich grazing offer to the rocky destitution of the Hunza gorges. Increasing numbers of nomadic herdsmen, both Kirghiz and Wakhi, now frequent the valley, which was an utterly deserted waste, and rarely used, even

as a route, while there were Hunza raiding-parties ready to swoop down from the mountain fastnesses southwards.

I also felt glad to be once more on the track of Hiuen Tsiang, whose footsteps I had traced to so many a sacred Buddhist site of ancient India. The position and remains of Tashkurghan were found to agree most closely with the description which Hiuen Tsiang and the earlier Chinese pilgrim, Sung-yun, give of the capital of the ancient Kie-pan-to. The identification of the latter territory with the modern Sarikol, first suggested by Sir Henry Yule, was thus fully established. The ruined town, which extends round the modern Chinese fort of Tashkurghan, and still shows a quadrangular enclosure of crumbling stone walls, "rests on a great rocky crag, and is backed by the river Sita" (*i.e.* the Yarkand river), on the east, exactly as the pilgrims describe it. As a striking instance of the tenacity of local tradition, it deserves to be mentioned that I found the curious legend which Hiuen Tsiang relates of the princess imprisoned in ancient days on a rock fastness still clinging to the identical locality of this valley.

I believe that Tashkurghan, as a historical site, has claim to even greater antiquity than that implied by the notices of Hiuen Tsiang and Sung-yun. Nature itself has plainly marked it not only as the administrative centre for the valleys of the Sarikol region, but also as the most convenient place for trade exchange on an ancient and once important route connecting great portions of Central Asia with the Far East and West. Judging from local observations, everything tends to support the view first expressed by Sir Henry Rawlinson that Tashkurghan, "the stone-tower," retains the position as well as the name of the λίθινος πύργος, which Ptolemy, and before him Marinus of Tyre, the geographer, knew as the emporium on the extreme western frontier of Serike, *i.e.* the Central Chinese dominions. From Tashkurghan the road lies equally open to Kashgar and Khotan, and thus to both the great trade routes which led in ancient times and during the middle ages from Turkestan into the interior of China. At Tashkurghan, also, the two best lines of communication across the Pamirs converge, the Taghdumbash valley, which gives access to the upper Oxus, being met here by the route which leads over the Naiza-Tash pass towards the "Great Pamir" and thence down to Shighnan.

In order to extend our survey over ground that was geographically interesting, I chose for our further march to Kashgar the route which passes through the high valleys between the Russian Pamirs and the western slopes of the great transverse range of Muztagh-Ata. On July 13 I had reached the shores of the "Little" Karakul lake, at the northern foot of the "Father of ice-mountains," and *circ.* 11,000 feet above sea-level, where I found a fairly large encampment of nomadic Kirghiz. The ample supply of sturdy Yaks which we obtained from them greatly facilitated transport arrangements. It thus became possible

within the comparatively short time available to establish a series of excellent survey stations on various high spurs descending from Muztagh-Ata. They enabled us to extend the triangulation brought up from the Taghdumbash to the great glacier-crowned ranges facing Muztagh-Ata from the north and north-east and overlooking the Little Karakul lake (Fig. 2).

FIG. 2.—ICY RANGES NORTH OF MUZTAGH-ATA SEEN FROM LITTLE KARAKUL.

Their main peaks, though rising to over 23,000 feet, remain below the elevation of Muztagh-Ata. Yet these mighty walls of ice and snow, stretching their crest-line of dazzling whiteness for a distance of at least twenty-four miles, and streaked by numerous great glaciers, appeared perhaps even more awe-inspiring than the grand ice-girt dome of Muztagh-Ata itself (Fig. 3). Our stay in the midst of this mountain-world fell in what was probably the most favourable season; yet the hours when any considerable portion of the panorama was clear of clouds and driving rain or snow were few indeed. Notwithstanding the rapid changes of the atmospheric conditions and the difficulty of working a delicate instrument on heights ever exposed to cutting winds at temperatures that readily fell below freezing-point, the Bridges-Lee photo-theodolite proved very useful for recording topographical details. From the rounds of photo-theodolite views which were secured by me at a series of excellent survey stations, Lieut. Tillard, R.E., of the Trigonometrical Branch Office of the Survey of India, succeeded in constructing a map of the Muztagh-Ata region on the enlarged scale of 4 miles to the inch, which shows much additional detail. It will be published along with the general map embodying our survey. But both the taking of the photo-theodolite views and the working out of the results has absorbed a great amount of time and labour, and reference to the

plane-table sections has, I believe, often been found indispensable in plotting.

FIG. 3.—MUZTAGH-ATA, SEEN FROM LITTLE KARAKUL.

For the purpose of the photo-theodolite survey, and also in order to gain some closer personal experience of the "Father of ice-mountains," I made on July 18–19 two ascents on the western slopes of the central mass of Muztagh-Ata. The route chosen lay up the ridge which flanks the Yambulak glacier from the north, and, as seen from below, seemed to ascend unbroken to the northern of the twin peaks of the great mountain. It was by the same route that Dr. Sven Hedin, in the course of his explorations of 1894, had reached his highest point. But since the visit of the great Swedish traveller, the physical conditions on the surface of the ridge seem to have undergone a considerable change for the worse. At the time of his ascents the ridge appears to have been bare of snow up to an elevation estimated at over 20,000 feet, and consequently it had been possible to use yaks both for riding and transport. I found the ridge from *circ.* 15,500 feet upwards enveloped by heavy masses of snow, which seem likely to transform themselves gradually into a mantle of ice, such as lies over the other elevated slopes of the mountain. Only on the very edge of the precipitous rock-wall by which the ridge falls off towards the Yambulak glacier, small patches of rock protruded here and there from the deep snow. Above 17,000 feet even these disappeared, and at about the same height it was necessary to leave behind the yaks, which, foundering constantly in the deep snow, had become useless.

On the opposite side of the glacier the southern wall of rock is topped by a thick layer of ice to a far lower point, and consequently little avalanches would be seen gliding down from it as the day wore

on. Luckily, on our side the glittering snow-sheet over which we ascended seemed to rest as yet firmly on the rock. The weather was by no means favourable, and on the second day we had to contend with frequent gusts of violent wind, and with occasional showers of snow. The maximum elevation I then reached was, by the evidence of the hypsometrical readings, within a few feet of 20,000 feet. It had taken nearly eight hours of constant toil to attain it from my camp, pitched at an elevation of over 15,000 feet. The couple of Kirghiz, who could be induced to set out with us, were, curiously enough, first seized by mountain-sickness, and had to be left behind with their yaks. At an elevation of about 19,000 feet, Ram Singh, the sub-surveyor, was obliged to stay behind, overcome by headache and lassitude. Next, Ajab Khan, the active Puniali, who had accompanied me as an orderly from Gilgit, fell out, and ultimately only the two splendid men of the "Hunza Levies," who had been selected for me by the Mir of Hunza, and had proved most useful as guides, plodded on with me.

The previous day, while engaged in phototheodolite work, I had sent them ahead to reconnoitre the ridge. Excellent climbers as they are, they had then reached a point apparently about 2000 feet higher up. Their progress was there stopped by a sheer precipice of impassable rocks descending to what I conclude to be a transverse glacier previously hidden from view, separating the great ridge we followed from the main mass of the northern summit, and communicating northwards with the Kampar-kishlak glacier. Owing to the threatening aspect of the weather, I had to forego the attempt, which our bodily condition would have otherwise well permitted, of reaching this furthest accessible point of the ridge. I was thus unable to judge with my own eyes of the true mountaineering difficulties that would have to be faced in the event of a systematic effort being made to climb the northern summit from this side. An ample allowance of time, a good Swiss guide or two, and a sufficient number of hardy Hunza mountaineers to carry loads, would seem to me indispensable provisions for such an effort.

As we descended, the clouds lifted towards the west, and revealed a panorama vast and impressive beyond description. It extended practically across the whole breadth of the Pamir region. Far away to the south-west it was bounded by glittering pinnacles, in which I could recognize the mountain-giants that guard the approach to the Indus valley. They had worthy rivals to the north in some towering masses of ice and snow, which I could not fail to identify with Mount Kaufmann and other great peaks of the Trans-Alai range.

The night, which I passed, uncomfortably enough, in my tent, pitched with difficulty at an elevation of about 16,500 feet, brought fresh snow with driving gales, and, after vainly waiting next day for a change, I was forced to descend once more towards Lake Karakul. Before leaving this inhospitable yet so fascinating neighbourhood, I

had the satisfaction to ascertain that the Kirghiz legend of a hoary saint (Pir) mysteriously residing on the inaccessible heights of the great ice-mountain, still retains distinct features of the "old story" which Hiuen Tsiang heard of the giant Buddhist hermit, who was seen entranced "on a great mountain covered with brooding vapours," evidently identical with Muztagh-Ata.

On July 23 I started down on to the plains of Kashgar by the route of the Gez defile. Owing to the collapse of one of the bridges in this remarkably narrow and difficult gorge, I was obliged to make a considerable *détour*, which entailed the crossing of the huge Koksel or Sarguluk glacier descending northwards from the great range we had surveyed before from the side of Lake Karakul. The lower portion of the defile was rendered altogether impassable by the summer floods of the glacier-fed Yamanyar river. So I had to take to the difficult track known as Tokuz-Dawan, "the Nine Passes," and barely passable for laden animals, which crosses a series of steep transverse spurs descending from the little-known eastern slopes of the great snowy range behind Muztagh-Ata. Leaving the sub-surveyor and heavy baggage to follow by easier stages, I pushed on by rapid marches, and after a finishing march of some fifty miles from Tashmalik, on July 29 arrived at Kashgar.

There, under the hospitable roof of Mr. G. Macartney, C.I.E., the political representative of the Indian Government, the kindest reception awaited me. After fully two months of fatiguing and almost incessant travel in the mountains I felt the need of some bodily rest before I could set out again for Khotan, the proper goal of my explorations. But my four weeks' stay in Kashgar was mainly accounted for by other and more pressing considerations. In view of the wide extent of the area that was to be covered by my travels within a period practically limited to one autumn and winter, the careful organization of my caravan was a matter of much importance. In this respect the experienced advice of Mr. Macartney and the practical assistance of his establishment were of great value to me. It was essential to limit the baggage with a view to rapidity of movement, and at the same time to ensure that all stores and equipment required during prolonged travels, and under widely varying conditions, should be kept ready available. I found that, including riding animals for myself and followers, eight camels and twelve ponies would be needed for my caravan. The trouble taken about their selection was amply repaid by the result; for, notwithstanding the fatigues entailed by our subsequent travels, which covered an aggregate of over 3000 miles, none of the animals I brought from Kashgar ever broke down. In the same way the number of followers was kept down to the indispensable minimum, the party including two camelmen, two pony-attendants (one of whom had to act also as Chinese interpreter), a cook, and a personal servant for myself. Apart from the

sub-surveyor's Rajput cook, who had accompanied us from India, all the men came from Kashgar or Yarkand.

An important object of my stay at Kashgar was to familiarize the provincial Chinese Government with the purpose and character of my intended explorations. Mr. Macartney's efforts in this direction were entirely successful, owing mainly to the great personal influence and respect he enjoys among all Chinese dignitaries of the province. The result showed that from the Tao-tai, or provincial governor, downwards, all Chinese officials I came in contact with were ready and anxious to render me whatever help lay in their power. I look back to their invariable kindness and attention with all the more gratitude, as it was shown at a time when, as they knew well, the conflict with European powers was convulsing the empire in the East.

Such imperfect explanations and illustrations as, with an interpreter's help, I could give of the historical connection of ancient Indian culture and Buddhist religion with Central Asia, probably helped to dispel any doubts and suspicions which might otherwise have been roused by the intended excavations, etc. In this respect I found my references to the *Si-yu-ki*, the records of Hiuen Tsiang's travels, singularly helpful. All educated Chinese officials seem to have read or heard legendary accounts of the famous Chinese pilgrim's visit to the Buddhist kingdoms of the "Western countries." In my intercourse with them I never invoked in vain the memory of "the great monk of the Tang dynasty (*Tang-Sen*)," whose footsteps I was now endeavouring to trace in Turkestan, as I had done before in more than one part of India.

Busily engaged as I was during my stay at Kashgar with practical preparations, I managed also to survey a number of instructive ancient remains, chiefly ruins of Buddhist Stupas, in the vicinity, and to continue my studies of Turki. On September 11 I finally set out on the journey to Khotan. Choosing for the first portion of the march the track which crosses the region of moving sands around the popular shrine of Ordam-Padshah, I was able to fix the position of that curious pilgrimage place more accurately than is shown in existing maps. From Yarkand onwards I followed the ordinary caravan route, which leads along the southern edge of the great desert, and mostly through barren, uninhabited wastes of sand or gravel, towards Khotan. For me it had a special historical interest; a variety of antiquarian and topographical observations which I was able to make proved beyond doubt that we were moving along the identical great thoroughfare by which in earlier times the trade from the Oxus and the far West passed to Khotan and on to China.

It is impossible to refer here in detail to any of this evidence. But I may briefly mention at least the curious patches of ground frequently passed on the route beyond Guma, where the eroded loess is thickly strewn with fragments of coarse pottery, bricks, slag, and similar refuse,

marking the sites of villages and hamlets long ago abandoned. Such *débris* areas, locally known as *Tatis*, are to be found in many places beyond the present limits of cultivation in the whole Khotan region; in some places they extend over square miles. They exhibit everywhere most striking evidence of the powerful erosive action of the winds and sand-storms which sweep over the desert and its outskirts for long periods of the spring and summer. The above-named fragments rest on nothing but natural loess, either hard or more or less disintegrated. Having alone survived by the hardness and weight of their material, these fragments sink lower and lower as the erosion of the ground beneath proceeds, while everything in the shape of mud-walls, sun-burnt bricks, timber, etc., as used in the construction of Turkestan houses, has long ago decayed or been swept away.

On October 12 I reached Khotan town, the present capital of the territory which was to form the special field for my archæological explorations. I had entered the oasis on the preceding day with some feeling of emotion; for even before the discoveries that rewarded my labours, there was much to suggest the important part played by this little kingdom in that most fascinating chapter of ancient history which witnessed the interchange of the cultures of India, China, and the classical West. I lost no time before commencing the local inquiries which were to guide me as to the sites particularly deserving exploration. Apprehensions about possible forgeries, which experience proved to have been fully justified, had prevented me from sending in advance information as to the object of my journey. I now found that some time would have to be allowed for the collection of specimens of antiquities from the various old sites which Khotan "treasure-seekers" were in the habit of visiting. I was glad to utilize the interval for a geographical task which I knew to possess special interest.

That portion of the Kuen-luen range which contains the headwaters of the Yurung-kash or Khotan river, had never been properly surveyed, the only available information being contained in the sketch-map of the route by which Mr. Johnson, in 1865, had made his way from Ladak down to Khotan. Colonel Trotter had already, in 1875, expressed the belief that the headwaters of the Yurung-kash were much further to the east than shown in that map, and probably identical with a stream rising on the high plateau south of Polu. Captain Deasy, working from the side of Polu in 1898, succeeded in reaching the sources of this stream at an elevation of close on 16,000 feet, but was prevented from following it downwards. Thus the true course of the main feeder of the Yurung-kash, together with most of the orography of the surrounding region, still remained to be explored.

On the 17th October I started with the lightest possible equipment for the mountains. Pan-Darin, the Amban of Khotan, had, during the few days of my halt, done all that was needed to facilitate my

arrangements for transport and supplies, and to assure me local assistance. Subsequent experience showed that I had found in this amiable and learned Mandarin a true and reliable friend, thoroughly interested in my work, and ever ready to help me with all that was in his power. I feel convinced that without his active co-operation, and subsequently that of his Keriya colleague, neither the tour through the mountains nor the explorations in the desert could have been accomplished.

The valley of the Yurung-kash becomes impassable within one march of its debouchure. There, near the small villages of Jamada and Kumat, the precious jade is dug, from which the river takes its name ("white jade"). Hence the route to Karanghu-tagh, the southernmost inhabited place, leads over a series of more or less parallel ranges that separate side valleys draining from the east. These outer ranges, rising in a succession of plateaus fissured by deep winding ravines, exhibit in a most striking form the results of that extreme disintegration which is the characteristic feature of the whole mountain system. Nothing but loose earth, gravel, or conglomerate in the last stage of decomposition is to be seen on the surface of the hillsides; while their high elevation and the dryness of the climate prevent the growth of any but the scantiest vegetation in rare patches of low, tough grass. The effects of the dust-haze which rises so constantly over the desert plains were still sufficiently marked to prevent any distant view being obtained from the Ulugh Dawan, by which we crossed the Tikelik range at an elevation of about 12,000 feet. But from the next range, between the valleys of Buya and Pisha, a very extensive panorama opened out before us.

In a grand mountain-mass raising its glacier-crowned head in solitary splendour to the south-east, it was impossible to mistake the "Kuen-luen peak, No. 5," already triangulated from the Ladak side (Fig. 4). Behind this great mountain, for which the tables supplied by the Survey Department indicated a height of 23,890 feet, to the south and south-east, there was to be seen a magnificent line of high snowy peaks marking the watershed towards the westernmost portion of the Aksai-chin plateau of Tibet. It soon became clear that the Yurung-kash has cut its way between the main range and the great mass of "K5," or Muztagh ("the ice mountain," κατ' ἐξοχήν, as it is called by the few Taghliks of these valleys). Its course is indicated by a gap between the stupendous spurs which descend from Muztagh, and from the almost equally high peaks on the watershed range, and could, in the remarkably clear atmosphere that favoured us, be made out for a considerable distance to the south-east. It was found to run exactly in the direction where Captain Deasy had traced the real source of the river. In other respects, too, the orographical features actually before us differed strikingly from those which the above-mentioned sketch-map had led me to expect.

The next outer range, which was crossed at an elevation of close on 14,000 feet, offered a still better view of this magnificent panorama.

But vainly I searched the crest-line for other peaks which could be identified with points already triangulated from the Ladak side, and which would thus secure to us the eagerly sought connection with the Indian Trigonometrical system. The descent which followed, of some 6000 feet, to the deep rock-bound gorge of the Yurungkash, was by its steepness and ruggedness an experience long to be remembered, especially as night overtook us. The track was almost impracticable for our baggage ponies. Fortunately it was possible to replace them by yaks at Karanghu-tagh, a small settlement of herdsmen which, owing to its inaccessibility, is also used as a penal station for select malefactors from Khotan. "Karanghu-tagh" literally means "mountain of blinding darkness," —a fitting enough name for this terribly bleak place of banishment. The Kash river on which it lies is fed by a series of great glaciers on the main range to the south, and joins the Yurung-kash a few miles below the hamlet.

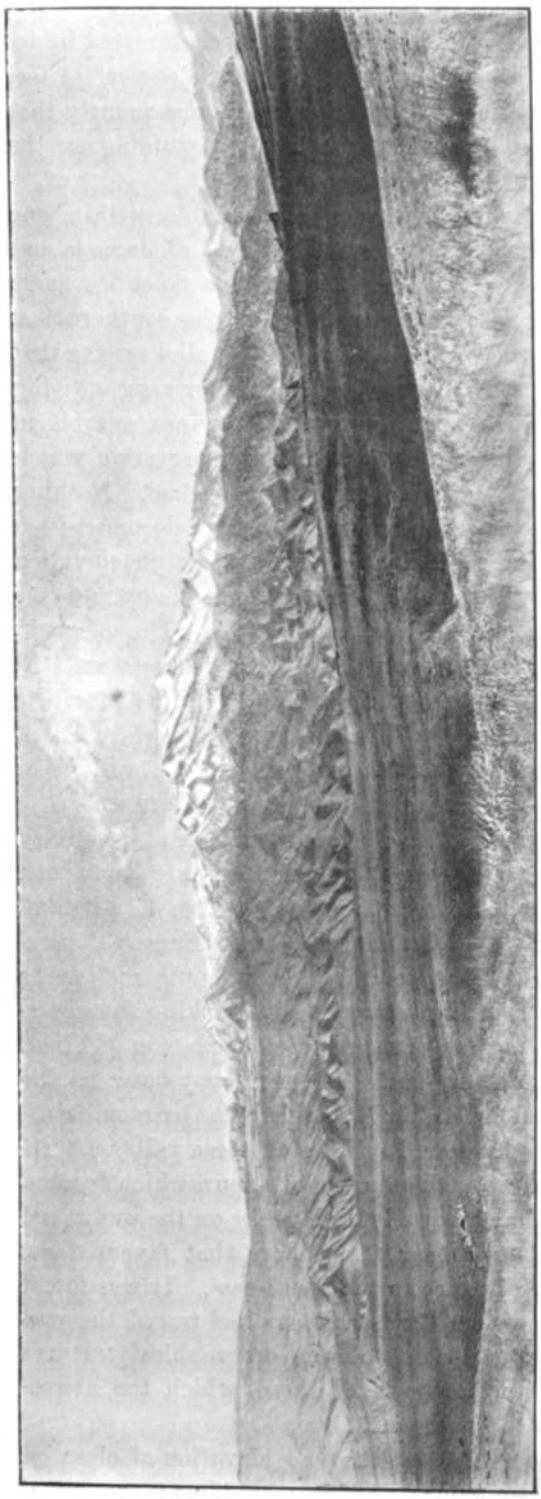

FIG. 4.—PEAK "KUEN-LUEN NO. 5" (OR "MUZTAGH"), SEEN FROM NORTH-WEST, WITH RANGES ABOVE YURUNGKASH GORGE ON RIGHT.

Leaving the ponies

and whatever of baggage could be spared at Karanghu-tagh, I endeavoured to follow up the gorge of the Yurung-kash as far as possible towards the head of the river. The hillmen knew of no track beyond a point known as "Issik-bulak," from its hot spring. There the river, unfordable even late in the autumn, fills completely the narrow passage it has cut round the mighty southern buttresses of "Kuen-luen No. 5," and progress becomes impossible, even for yaks. Accompanied by Ram Singh and a couple of Taghliks, I penetrated, on October 27, a few miles further into the gorge, climbing with difficulty along the precipitous cliffs which face the frowning ridges on the south. But no track could be discovered practicable for load-carrying men, and ultimately I had to turn back. It was impossible for me to wait for the chance of the river getting completely frozen. Even then I doubt whether a practicable passage could be secured, considering the rigours of the winter and the masses of fallen rock likely to be encountered. It is from the high but comparatively open ground near the sources far away to the south-east that the uppermost portion of the river course will have finally to be explored.

From Karanghu-tagh we proceeded to the north-west by a difficult route, which forms the only connection of the valley with the outer world besides that we had come by. It required a good deal of negotiation and "demi-official" pressure before the surly hillmen of Karanghu-tagh would supply guides and yaks for it. The inhospitable mountain tract into which it took us had so far remained wholly unexplored.

Over a succession of high transverse ranges we crossed into the valleys of Nissa and Chash. By camping close to the passes we managed to climb to some excellent survey-stations, particularly on the Brinjak ridge, some 15,300 feet above the sea. The views I obtained there will show, better than any description could, the weird grandeur of this mountain scenery (Fig. 5). Below a glacier-clad crest-line, of an approximate height of 20,000 feet, there rise in all directions fantastically-serrated ridges, with deep gorges between them, like the waves of an angry sea. Exceptionally clear weather favoured us; but the increasing cold and the exposure inevitable on such elevated ground made survey-work, especially with the photo-theodolite, very trying.

Beyond the Yagan-Dawan pass, by which I crossed into the drainage area of the Kara-kash ("black jade") river, I had ample opportunity to observe the extraordinary results produced by erosion on mountain formations subject to excessive disintegration (Fig. 6). It appeared to me that only the erosive action of water could have produced that perfect maze of deep-cut arid gorges through which we had to wind our way. Yet in this very region the fall of rain and snow is now very scanty, and the consequent absence of water is a serious obstacle for the traveller. Luckily, we could overcome it by the transport of ice.

FIG. 5.—GLACIERS AT HEAD OF KASH RIVER, SEEN FROM BRINJAK RIDGE.

FIG. 6.—ERODED RANGES TO SOUTH-EAST OF YAGAN-DAWAN.

I had almost despaired of connecting our survey work with the Indian triangulation, when unexpectedly the last range we had to cross towards the plains revealed a view more extensive than any before. Among the many high snowy peaks visible southwards, and also beyond the upper Karakash river, two more triangulated points, besides "Kuen-luen No. 5," could be identified with certainty. It thus became possible to determine our position on the Ulughat-Dawan, close on 10,000 feet above the sea, by theodolite and to measure angles to all prominent heights of the ranges within view. To the north there extended, boundless like the sea, the vast plain of the desert. The light dust-haze covering it looked beautiful as it reflected the brilliant moonlight of that first night I spent on the pass waiting for the arrival of water. The dinner for which it was needed, did not get ready till 2 a.m. I knew that a wind raising the haze would effectively stop further survey work. So I hurried to reach another high ridge further east, with an equally extensive view, that would allow us to complete the triangulation. It was successfully climbed after a great *détour* that cost us two days, and just in time. As the work was approaching completion, a strong wind sweeping over the desert carried up a thick dust-haze, and for weeks effaced all distant views. Some prominent peaks in the outer range of hills, which are visible from Khotan town when the atmosphere is clear, have been fixed by our work. With the help of these points it will be possible to connect Khotan with the Indian trigonometrical system, and finally to verify its longitude. But such occasions of dust-clear weather are rare, and of the only one which occurred during my subsequent short stay in Khotan, in April, full advantage could not be taken by myself. Thus this task is still left to a future traveller, who will be able to afford time for patiently awaiting his opportunity at Khotan.

By the middle of November I had returned to Khotan, where, after our rough and rapid marches through the mountains, I was glad to allow my men and animals a well-earned short rest before starting once more for the winter's work in the desert. I myself was busy at work with the examination of the antiquities which the prospecting parties, sent out a month earlier, had brought back from various sites in the desert. I also made a series of excursions for the purpose of a close survey of the old localities within the Khotan oasis itself. This enabled me satisfactorily to settle numerous questions bearing on its ancient topography, and in particular to locate almost all the sacred Buddhist shrines which are described to us by the early Chinese pilgrims. Their positions were invariably found to be occupied now by Muhammadan Ziarats, or Saints' tombs, which form the object of popular pilgrimage. Local worship can thus be shown to have outlived the great change in religion consequent on the Muhammadan conquest. Its tenacity has indeed proved quite as useful for the study of the ancient topography

of Khotan as it had proved to me before in Kashmir and other parts of India.

I must restrict myself here to a few remarks only concerning the most interesting of those old localities—the site of the ancient capital. Its *débris*-layers, which have furnished by far the greatest portion of the Khotan antiquities, such as terra-cottas, seals, coins, etc., acquired by former travellers, lie buried deep below the fields of the little village of Yotkan, some seven miles to the west of the present town. Gold-washing operations, originating in an accidental discovery of gold some thirty-seven years ago, have gradually led there to the excavation of an area over half a mile square. The careful examination of the banks thus laid bare showed me that the "culture-strata," as I should call them, of Yotkan are composed of the rubbish that gradually accumulated during the centuries while the site continued to be occupied by houses, from about the commencement of our era until after the advent of Islam (in the eleventh century of our era). These "culture-strata," themselves 5 to 14 feet thick at various points, are covered by a layer of pure soil from 9 to 20 feet in thickness. This layer, which shows no sign of stratification, is manifestly due to silt-deposit, the necessary result of intensive and long-continued irrigation such as prevails all over the oasis. Owing to the disintegrated condition of the soil, all the water that is brought down from the mountains by the Yurung-kash and Kara-kash rivers, and subsequently distributed by innumerable irrigation channels, carries an excessive quantity of sediment. The silt thus deposited over all cultivated areas is amply sufficient to account for the gradual burying of the rubbish layers of the ancient capital and for other curious observations I have made as to the gradual raising of the ground level throughout the oasis. All antiquarian and physical evidence combines to oppose the assumption of a great flood or similar catastrophe, such as some earlier European visitors of the site have suggested.

Among the ancient sites in the Taklamakan desert which are frequented by Khotan "treasure-seekers," and which the prospecting parties sent out by me had visited, none seemed to offer better opportunities for systematic excavations than the one known to them as Dandan-Uiliq. Turdi, an old and, as experience showed, reliable member of that fraternity, had brought me from there some interesting relics, including fragments of Buddhist sculptures, an inscribed piece of fresco, and a small but undoubtedly genuine scrap of paper with ancient Indian Brahmi characters. Further inquiries made it certain that Dandan-Uiliq was identical with the ruined site which Dr. Sven Hedin had seen on his march to the Keriya Darya, and which in the narrative of his travels is spoken of as "the ancient city Taklamakan."

After hurriedly completing in Khotan the preparations for our winter campaign, I started on December 7 for Tawakkel, a small oasis

on the outskirts of the forest-belt which accompanies the Yurung-kash on its course through the desert. Thanks to the stringent orders issued by Pan-Darin, the kindly Amban of Khotan, I speedily secured there the thirty labourers I wished to take with me for purposes of excavation, as well as a four-weeks' food-supply. Owing to the reluctance of the village cultivators to venture far into the desert, it would otherwise have been difficult to obtain sufficient labour, especially in view of the rigours of the winter. The ponies, for which the desert offered neither sufficient water nor food, were sent back to Khotan while we set out on foot, the heavily laden camels carrying the food-supplies, together with the indispensable baggage. Marching in the drift-sand was slow work, though the dunes amidst which we passed as soon as we had left the east bank of the river nowhere rose above 15 feet. Within five days Turdi had safely guided us through the sandy waste to the area where the trunks of dead poplars, rising shrivelled and gaunt from between low dunes, indicated the vicinity of ancient cultivation. On the following day (December 18) I had my camp pitched in the middle of the ruins I was in search of.

I soon found that the structural remains of the site consisted of isolated groups of small houses scattered over an area about 1½ miles from north to south and three-quarters of a mile broad. The walls, constructed throughout of a wooden framework covered with plaster, were either broken down within a few feet from the ground if exposed, or, where covered by low dunes, could be made out by the wooden posts of the framework sticking out from the sand. The structures left more or less exposed had already been searched by native "treasure-seekers." Their operations repeated in successive seasons had, together with the erosive action of the wind, caused great destruction among these ruins. But the scanty remains left on some walls of frescoes representing Buddhas, or Bodhisattvas, showed at once plainly that the ruins belonged to the Buddhist period, and that some of them must have served as Buddhist places of worship.

Luckily the native "treasure-seekers" are prevented by the difficulty of carrying sufficient supplies from stopping longer than a few days. Hence they had never been able to attack the ruins more deeply covered by the sand. Thus when I commenced with my little force of labourers the systematic excavation of structures half buried by low dunes, most interesting archæological results soon began to reward me. From the Cellas of little Buddhist shrines there came to light in large numbers stucco images and relievos, frescoes and painted wooden tablets, all showing representations of saints and legends of sacred Buddhist lore (Fig. 7). In style and technical treatment they exhibit a close resemblance to that period of ancient Indian art which is best known to us from the latter Ajanta cave paintings. Wherever protected by the dry desert sand, the colours have survived in remarkable freshness. Here, then,

were rising from their tomb long-lost relics of that Indian art which had found a second home in Buddhist Central Asia before spreading further into the Far East.

Great was my joy when, on excavating what must have been the ground-floor room of a small monastic dwelling-place, the men came upon the first leaves of paper manuscripts. Carefully extracted with my own hands and cleared, they proved to contain portions of a Buddhist canonical text in Sanskrit. Judging from the palæographic character of the writing, these and subsequent finds of fragmentary Sanskrit manuscripts from Dandan-Uiliq ruins may approximately be assigned to

FIG. 7.—STUCCO SCULPTURES AND FRESCOES IN BUDDHIST TEMPLE CELLA EXCAVATED AT DANDAN-UILIQ.

the sixth or seventh century of our era. In addition to such texts in the classical language of India, the literary discoveries of this site include a considerable number of manuscript folia and of detached documents on paper, written in Indian Brahmi characters, but in a non-Indian language. Taking into account that the same strange language appears in inscriptions affixed to some frescoes, it seems probable that we have here records of the indigenous tongue actually spoken by the Khotan people of that period. Only the close study of all these documents—a task which may take years—is likely to lead to a decipherment, and thus to a solution of this interesting question.

In the mean time, it is fortunate indeed that the discovery of

Chinese paper documents in other small monastic dwellings permits us to determine with accuracy the period when the settlement represented by the settlement of Dandan-Uiliq was finally abandoned. Among the neatly folded small paper rolls containing letters, records of loans, petitions, and similar matter, there are three at least which already, on preliminary examination at Kashgar, proved to be dated with precision, the Chinese years indicated corresponding to the years 778, 782, 787 of our era. There are good reasons for assuming that these petty records do not precede by any great length of time the date when the dwellings were abandoned. We thus obtain the end of the eighth century as the approximate chronological limit for the existence of Dandan-Uiliq as an inhabited locality. This dating is entirely supported by the evidence of the numerous old Chinese coins I found at the site, the latest bearing the symbols of the dynastic period, which corresponds to the years 713–741 A.D.

The three weeks I spent in continuous excavations, from the early morning until daylight failed us, enabled me to explore all ruins traceable under the sand. It was a happy time for me personally, though the physical conditions were trying. The severe winter of the desert had already set in when I started from Khotan. During my stay at Dandan-Uiliq, the temperature at night usually went down to a minimum of about 10° Fahr. below zero. In the daytime it never rose above freezing-point in the shade. The weather was cloudy, but luckily there was very little wind. Its absence is an essential condition for all prolonged work in the desert. The dead trees of the little orchards which once surrounded most of the scattered groups of shrines and dwellings supplied fuel in plenty. Yet the men suffered from the exposure as well as from the badness of the water, the only available supply coming from a brackish well they had succeeded in digging in a depression of the ground over a mile from the main ruins. My own little tent brought from India, though provided with an extra serge lining, was a bitterly cold abode at night. When the temperature had once gone to about 6° below freezing-point, writing or reading became impossible, and I had to take to my bed, however anxious I might have been to study the manuscript finds of the day, etc. But, from long experience, life in a tent seems the one most congenial to me, and, with such fascinating work to occupy me, the four and a half months spent in the desolation of the desert were indeed an enjoyable time.

During my stay at Dandan-Uiliq, Ram Singh had again joined me from the direction of the Keriya river. I had despatched him a month earlier on an independent survey of the high range which extends between "Kuen-luen No. 5" and the mountains eastwards where connection could be obtained with Captain Deasy's work about Polu. On comparing my own plane-table fixing for Dandan-Uiliq with his, a gratifying surprise awaited me. Notwithstanding that we had brought

our survey from entirely different directions and over great distances of such deceptive ground as sandy plains and dunes, I found that Ram Singh's position differed from my own by only about a mile in latitude and half a mile in longitude.

My detailed survey of the Dandan-Uiliq site, together with other observations of a semi-topographical, semi-antiquarian nature which gradually accumulated during my explorations at this and other sites, make it very probable that the lands of Dandan-Uiliq were irrigated from an extension of the canals which had, down to an even later date, brought the water of the streams of Chira and Gulakhma to the desert area due south of the ruins. I must reserve for another occasion a discussion of the archæological evidence as to the causes which led to the abandonment of this advanced settlement. There is every reason to believe that this abandonment was a gradual one, and in no way connected with any sudden physical catastrophe. The Sodom and Gomorrha legends heard all over Turkestan about "old towns" suddenly submerged under the sand-dunes, are more ancient than the ruins of Dandan-Uiliq themselves, and interesting as folk-lore. But where we have plain historical and antiquarian evidence to the contrary, scientific inquiry can have no concern with them.

On January 6 I dismissed my Tawakkel labourers who had worked so valiantly, and after a three days' march over truly forbidding ground, struck the Keriya Darya. The successive ridges of sand, rising to heights of about 200 feet, were the most formidable I ever crossed. A four-days' march along the hard-frozen river brought us to the oasis and town of Keriya, where Khon-Daloi, the Amban, accorded me the heartiest welcome. There I first heard of the existence of "an old town"—*kone shahr*, as all ruins are popularly called in Turkestan—in the desert north of the well-known pilgrimage place of Imam-Jafar-Sadik. The information was very scanty, and the distance great. But certain indications pointed to a site of special interest; so I decided to set out for it after a few days' halt needed to rest my followers.

At Niya, which is the easternmost permanently inhabited place of the district, just as in the days of Hiuen Tsiang, who notices it under the name of Ni-jang, I received most encouraging proof that I was on the way to a site far older and hence more important than any I had examined so far. Owing to its great distance, the Khotan "treasure-seekers" knew, luckily, nothing of it. An adventurous young villager from Niya was the only man who in recent years had visited the ruins. From one of the ruined houses he had picked up two small wooden tablets. When they were brought to me I noticed at once that the writing they contained was in the ancient Indian script known as Kharoshthi, and of a type that chronologically belongs to the first and second centuries of our era. I hid my delight as well as I could, and pushed on still more rapidly, after securing a sufficient number of

labourers and the needful supplies for prolonged excavations. After a three days' march through the belt of thick jungle which lines the winding course of the Niya river through the desert, the curious shrine of Imam Jafar Sadik was reached. There the river finally loses itself in the sands, and as water cannot be obtained by digging, we had to depend for our further progress on what could be carried along from that locality. Fortunately the intense cold still prevailing through this and the following month (on January 26 I registered a minimum of 12° Fahr. below zero) permitted its convenient and regular transport in the form of ice.

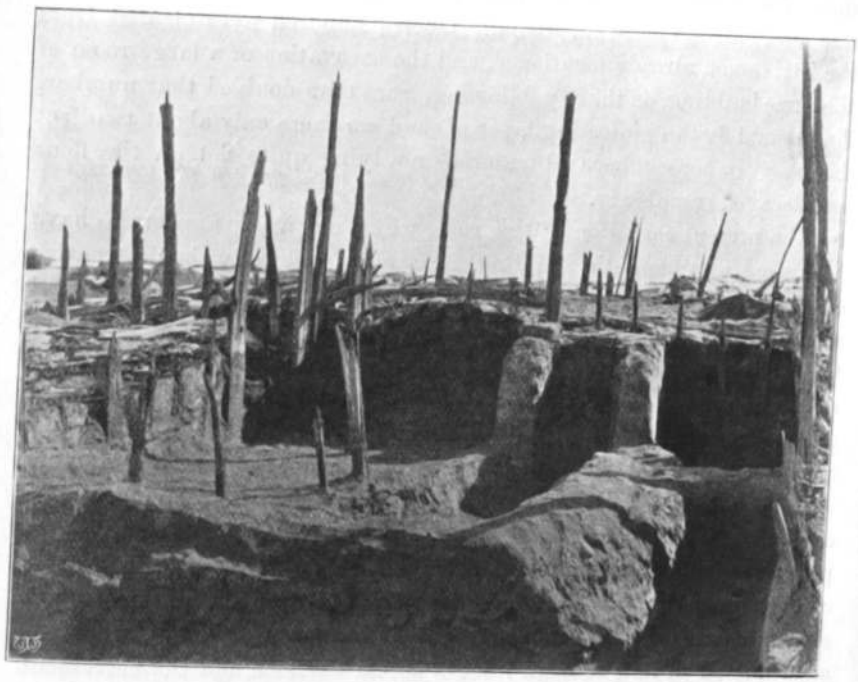

FIG. 8.—ROOM OF ANCIENT DWELLING (FIRST FIND-PLACE OF INSCRIBED TABLETS), NIYA RIVER SITE, AFTER EXCAVATION.

After a march of about 30 miles through the desert northward, I arrived on the evening of January 27 at the southern edge of the wide area over which are scattered the ruins I was in search of. The subsequent explorations showed that it extends for over 11 miles from north to south, with a maximum breadth of about $4\frac{1}{2}$ miles.

Pitching my camp near a small Stupa half buried in the sand, I proceeded next morning to the ruined house where Ibrahim, the young Niya villager already mentioned, had unearthed his inscribed tablets. He declared he had left more *in situ*. It was a moment of cheerful excitement when I approached the timber *débris*, rising like the remains of a wreck from the eroded ground around it. On the sandy slope I found at once some

tablets actually exposed, and many more scattered about under a slight layer of drift-sand within the small room where Ibrahim had originally unearthed them (Fig. 8). The house which contained it had, like the rest of the buildings at this site, been constructed of a wooden framework of massive beams and posts. Between the latter rose the walls of hard plaster, strengthened internally by thick mattings of rushes. These walls had completely decayed where not actually covered by sand, but the posts, now blanched and splintered, still rise high above the surface. In the building first explored, the sand, which during former centuries must have protected it, had largely drifted away. The remarkable state of preservation in which many of the inscribed tablets were found, was hence all the more surprising. Over a hundred were cleared from the little room already mentioned, and the excavation of a large room of the same building, on the day following, more than doubled that number. Unfortunately the protecting layer of sand was here only about two feet deep, and in consequence all materials not lying quite flat on the floor had decayed completely.

The present condition of this ruin, which originally appears to have been used as a monastic building, illustrates strikingly the destructive effect of erosion on this and other structures of the site. The actual remains of the building occupy a small plateau raised now 12 to 15 feet above the immediately surrounding ground. The lower level of the latter is the unmistakable result of erosion. While the strip of ground actually protected by the *débris* of this and similar structures retains the original level, the open surface near by, consisting of mere loess, has been gradually lowered by the action of the wind. The drift-sand carried along this portion of the desert is not sufficient at present to fill the depression thus created. From the geological point of view, not less than from the archæological, it would be interesting to study the exact conditions under which the power of the desert winds asserts itself in its two main lines of action—erosion and the movement of drift-sand. But I am convinced that it will take years of minute and systematic observation before any safe conclusions can be arrived at as to the rate at which the work of these forces proceeds in various parts of the Taklamakan. And even then there will be little to guide us as to the corresponding conditions prevailing during earlier historical periods.

While most of the buildings of this important site had suffered from erosion, there were others where parts at least were still buried under deep sand (Fig. 9). From some of these my excavations brought to light many very interesting objects illustrating the industrial arts of the period. The articles of ornamental wood-carving, which include elaborately worked chairs, small architraves and other architectural pieces, etc., show decorative motives familiar to us from the *relievo* sculptures of the ruined Buddhist monasteries on the North-West Frontier of India,

the ancient Gandhara. The date thus indicated fully agrees with the chronological evidence of the Kharoshthi writing on the wooden tablets, apparently memoranda and lists, found scattered in various rooms of the same dwellings. Broken pieces of arms, household implements, a musical instrument and similar objects of domestic use, all of wood, help vividly to bring before our eyes the conditions of everyday life of this distant region in the first centuries of our era.

It was difficult for me to realize fully that so many centuries had passed since these dwellings were deserted while I traced the plan and arrangement of the orchards and gardens once surrounding them. Rows of fallen poplars, some 50 feet in length, half-covered by the sand, showed the position of avenues, such as are planted to this day

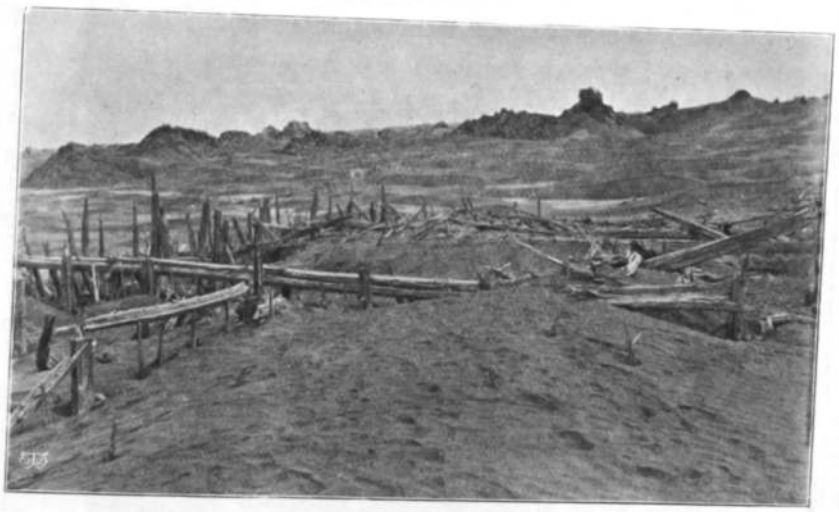

FIG. 9.—SAND-BURIED ANCIENT HOUSE, NIYA RIVER SITE, BEFORE EXCAVATION.

everywhere along the roads and canals of Turkestan oases. The rush-fences used then, as now, for the enclosures of gardens could be seen sticking out from the sand. A little digging along them often revealed small heaps of dry leaves that must have accumulated there while the trees, now reduced to blanched and withered trunks, were still thriving. Among these my diggers had no difficulty in distinguishing various fruit trees, such as the peach, plum, apricot, mulberry, etc., with the wood of which they are familiar from their own homes.

The character and conditions of the articles found within the houses plainly showed that they had been cleared by their last inhabitants, or soon after their departure, of everything that possessed value. Luckily, there were left behind the rubbish heaps to reward me with finds of the greatest antiquarian interest. The richest mine of this sort was struck in a small and much-decayed building, one room of which proved to contain a consolidated mass of refuse, lying fully

4 feet above the original floor. Among the layers of broken pottery, rags of felt and of woven fabrics, pieces of leather and other rubbish, I discovered there over two hundred documents on wood, of all shapes and sizes. Besides tablets with the Indian Kharoshthi writing, which form the great majority, there came to light numerous narrow pieces of wood

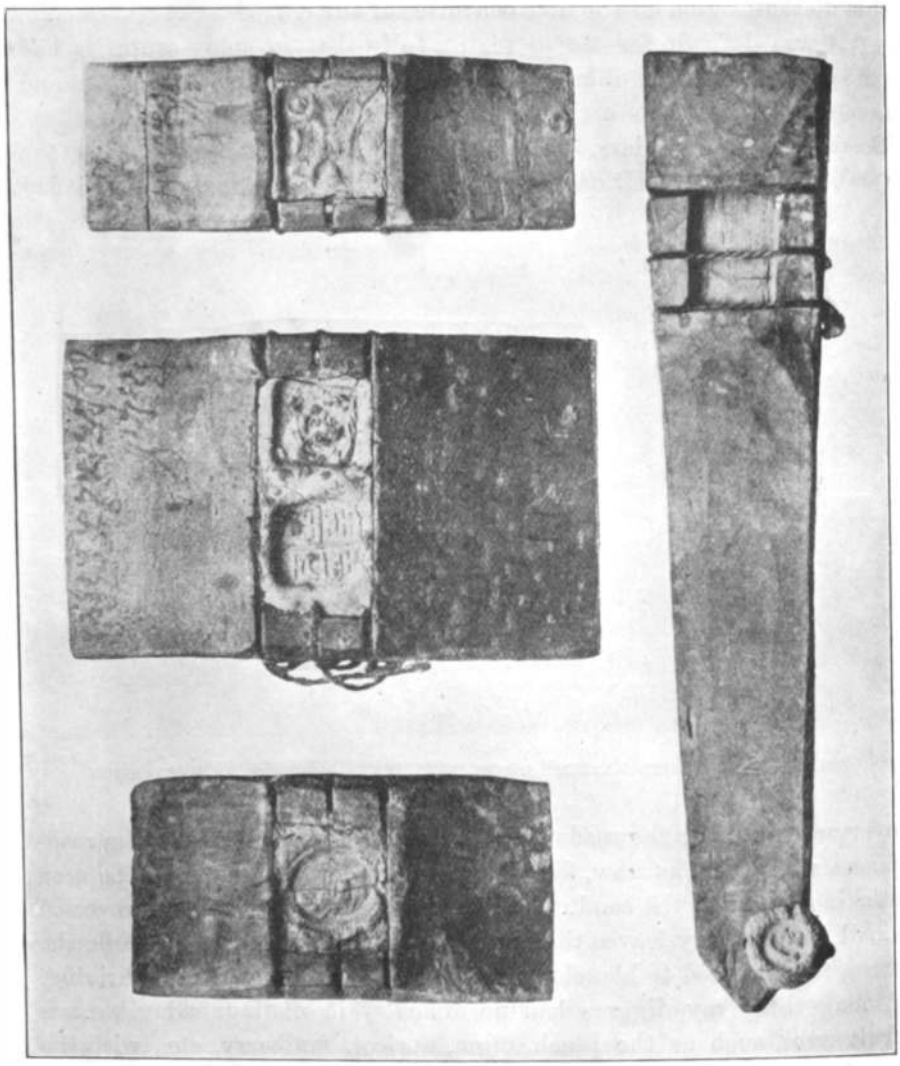

FIG. 10.—COVERING TABLETS OF ANCIENT KHAROSHTHI DOCUMENTS ON WOOD, WITH CLAY SEALS (¼).

bearing Chinese characters, and two dozen Kharoshthi documents on leather, a material one could hardly expect to find among a Buddhist population with an Indian civilization.

Many of the Kharoshthi tablets unearthed are in excellent preservation, and still retain the original clay seals and strings with which they were fastened (Fig. 10). We are thus able to study exactly the technicalities connected with the use of wood as a writing material. This is

not the place to discuss such details, but I may mention at least that each document intended as a letter or record of some importance, whether wedge-shaped or oblong, is provided with a carefully fitted covering piece or envelope bearing the address or "docket" entry. An ingeniously designed system of fastening with a string and a neatly inserted clay seal, prevented unauthorized inspection of the contents.

The remarkable series of clay seals discovered on these tablets is of exceptional interest, because it furnishes most convincing evidence of the influence which classical Western art has exercised even in distant Khotan. A frequently recurring seal, probably that of an official, shows the figure of Pallas Athene, with shield and ægis, treated in archaic fashion. Another fine seal is that of a well-modelled naked figure of pure classical outline, perhaps a seated Eros. On others, again, appear portrait-heads showing classical modelling, though barbarian features, etc. We know well how classical art had established its influence in Bactria, and on the North-West Frontier of India. But there was little to prepare us for such tangible proofs of the fact that it had penetrated so much further to the east, to halfway between Western Europe and Peking. I may note here, as an interesting discovery made while these pages are passing through the press, that Professor Karabacek has traced the remains of a Greek legend, apparently a magic formula, impressed on the edge of one of the clay seals, containing in its centre the figure of Athene Promachos.

From the contents of the documents themselves we may confidently expect much fresh light upon a chapter of Central Asian history and civilization which until now has seemed almost entirely lost. Owing to the great number of the texts, the cursive character of the script, and peculiar difficulties connected with the nature of the records, their complete decipherment will require much time and labour. But it is already certain that, as I recognized in the course of my first examination on the spot, the language of the documents is an early form of Indian Prakrit, with a large admixture of Sanskrit terms. It is highly probable that most of them contain official orders, such as safe conducts, correspondence, etc., as well as private memoranda and records. Religious texts, prayers, etc., may be suspected in some of the long tablets, found in what seem to be shrines or monasteries. Many of the documents bear exact dates, in which the years are indicated with reference to the reigns of named rulers. These will enable us probably to restore a portion of the historical chronology of this region.

But whatever revelations of interesting detail may be in store for us, one important historical fact stands out clearly already. The use of an Indian language in the vast majority of these documents, when considered together with the secular character of most of them, strikingly confirms the old local tradition recorded by Hiuen Tsiang, that the territory of Khotan was conquered and colonized about two centuries

before our era by Indian immigrants from the North-Western Punjab. It is a significant fact that the Kharoshthi script used in our tablets was peculiar to the very region of ancient Taxila which the above tradition names as the original home of those immigrants. It is strange indeed that the ruined dwellings of a settlement far away in the barbarian North, overrun by what Hindu mythology knew as the "great sand ocean," should have revealed to us, after nearly two thousand years, the oldest written documents (as distinguished from inscriptions), and of a type of which ancient specimens have never come to light as yet in India proper. It is equally strange, and yet easily explained by the historical connection of Khotan with China, that we should find buried along with them what are likely to prove the oldest written Chinese records, actually extant.

There is ample evidence to show that this remarkable site must have been deserted already within the first few centuries of our era. Apart from the Kharoshthi writing of the tablets and leather documents, which agrees closely in its palæographic features with the Kharoshthi inscriptions of the Kushana kings of the first and second centuries, there is the eloquent testimony of the coins. The very numerous finds, extending over the whole area, which were made during my stay, include only copper pieces of the Chinese Han dynasty, whose reign came to a close in A.D. 220. The use of wood as the only writing material, apart from leather, is also a proof of great antiquity. The use of paper for writing purposes is attested in Chinese Turkestan from at least the fourth century A.D. onwards; yet among all the ruined houses and ancient rubbish-heaps not the smallest scrap of paper was discovered.

After three weeks of almost incessant excavation work, I left this fascinating site which had yielded such rich antiquarian spoil, in order to visit, further to the east, ruins I had heard of at Niya. A march of about 100 miles through the desert, due east of Imam Jafar, brought us to where the Endere stream is lost in the sands. After a day's march further to the south-east I found a ruined Stupa, and at some distance from it a small circular fort filled with sand-buried buildings.

My excavations at what proved to be a Buddhist temple, situated in the very centre, brought to light some interesting stucco sculptures, and besides, a considerable quantity of manuscript leaves on paper. They belong to a variety of texts in Sanskrit, Tibetan, and the unknown language written in Indian characters, already referred to in connection with Dandan-Uiliq. The Tibetan leaves, containing, as Mr. Barnett of the British Museum has ascertained, portions of a translation of the Salisthambasutra, a Buddhist canonical text, undoubtedly are the oldest written remains of that language as yet discovered. It was curious to note how the folia which originally belonged to a fairly large manuscript had been cut up and separately deposited, manifestly as votive offerings, at the pedestals of various images. A pious visitor of

the shrine had evidently endeavoured to propitiate with his text as many divinities as possible. To other curious discoveries made there, such as Tibetan and Chinese Sgraffitti, small votive offerings of elaborately woven fabrics in silk and cotton, etc., I can only allude here. But as a point of chronological importance it may be mentioned at least that in one of the Chinese Sgraffitti, of which I brought away photographs, Prof. Douglas has since read a date corresponding to A.D. 790.

The proofs of Tibetan occupation showed me that I had reached at Endere the easternmost limits of the territory with the archæological exploration of which I was concerned. So on February 26 I could turn back with a good conscience towards the west, where several sites yet remained to be examined. The journey to Keriya, a distance of over 180 miles, was covered in seven forced marches. The energetic assistance of Khon-Daloi, the Amban, who had followed my movements with the friendliest care and interest, allowed me to set out at once with fresh labourers, transport, and supplies, for Karadong, the ancient site in the desert, some 150 miles north of Keriya, which Dr. Sven Hedin had first visited.

This so-called "ancient city" proved to contain little more than the ruins of a roughly built, quadrangular structure, which probably had served as a fortified *Sarai*, or post, on the ancient route leading along the Keriya Darya towards Kuchar in the north. My excavations at this desolate spot were carried on under considerable difficulties. The height of the dunes which covered the interior of the great quadrangle was considerable, and daily we were visited by sand-storms of varying degrees of violence. The finds, which were scanty, as I had expected, curiously enough included small quantities of remarkably well-preserved cereals, such as wheat, rice, pulse, etc., found embedded in the floor of what evidently was an ancient guard-room.

A series of hurried marches brought me back once more to the vicinity of the present inhabited area. Various antiquarian and topographical considerations made me look out in the desert north of the oasis of Gulakhma for the remains of the town of *Pi-mo*, which Hiuen Tsiang visited on his way from Khotan to Niya, and which is probably mentioned also by Marco Polo under the name of *Pein*. After a search, rendered difficult by the insufficiency of guides and the want of water, I succeeded in tracing it in an extensive *débris*-covered site, known as "Uzun-Tati" ("the distant Tati"), in the desert north of the oasis of Gulakhma. Far-advanced erosion and the operations of treasure-seekers from the neighbouring villages have left little of structural remains, but the usual *débris* of broken pottery, glass, china, etc., was plentiful.

A close inspection of the conditions under which cultivation is carried on in this vicinity, along the edge of the desert, was very instructive from the point of view of historical topography. I found that, owing to a difficulty of conducting the irrigation water sufficiently far, some villages of this oasis had, within the memory of living men, been shifted

as much as 6 to 8 miles further to the south. The crumbling ruins of the old village homesteads, stripped of all that could be of use, are still to be seen. Over miles of ground, which the desert sand is slowly over-running, the lines of empty canals, embanked fields, etc., can be made out with ease. It was the best illustration I could have of the process which many centuries ago must have followed the abandonment of ancient localities like the Niya river site and Dandan-Uiliq.

Increasing heat by day and recurring dust-storms warned me that the season was close at hand when work in the desert would become impossible. So as soon as I had returned to the outskirts of Khotan on April 5, I set out for the ancient sites which still remained to be examined in the desert north-east of the oasis. There a discovery of unexpected importance awaited me; for when, after examining Aksipil and other *débris* areas, I arrived at Rawak, of which Turdi, my honest old guide, had spoken merely as "an old house," I found before me a large Stupa, forming, with its enclosing quadrangle, by far the most imposing of all extant ruins of this region. The excavations I at once commenced along the massive walls of the great stupa court revealed a remarkable series of colossal statues in stucco, representing Buddhas or Bodhisattvas, with many smaller relievos between them (Fig. 11). The walls were further decorated with elaborate plaques forming halos, as well as with fresco paintings. The whole of the relievo work had originally been painted.

The careful excavation of this wealth of sculpture was a difficult matter. The interior framework of wood, which once supported the masses of stucco, had rotted away, and, deprived of this support, the heavy images threatened to collapse when the protecting sand was being removed (Fig. 12). The risk was considerably increased by the Burans, which were blowing with more or less violence during the whole of my stay. Extreme care was needed in clearing the statues, and their lower portions had to be covered up again as soon as they had been photographed. An attempt to remove the larger sculptures was quite impracticable owing to the extremely friable condition of the stucco and the difficulties of transport. But of the smaller ones and of pieces found already detached I succeeded in bringing away a considerable number without mishap.

The Rawak relievos show in style and most details of execution the closest affinity with the so-called Græco-Buddhist sculptures of the ruined monasteries and shrines on the North-West Frontier of India. This makes their close study, with the help of the numerous photographs I secured, a matter of great historical and artistic interest. Though no epigraphic or manuscript remains have come to light, the evidence of the numerous coins I found, deposited as votive offerings, goes far to prove that the sculptures of the Rawak Stupa belong approximately to the same period as the ruins of the "Niya River Site."

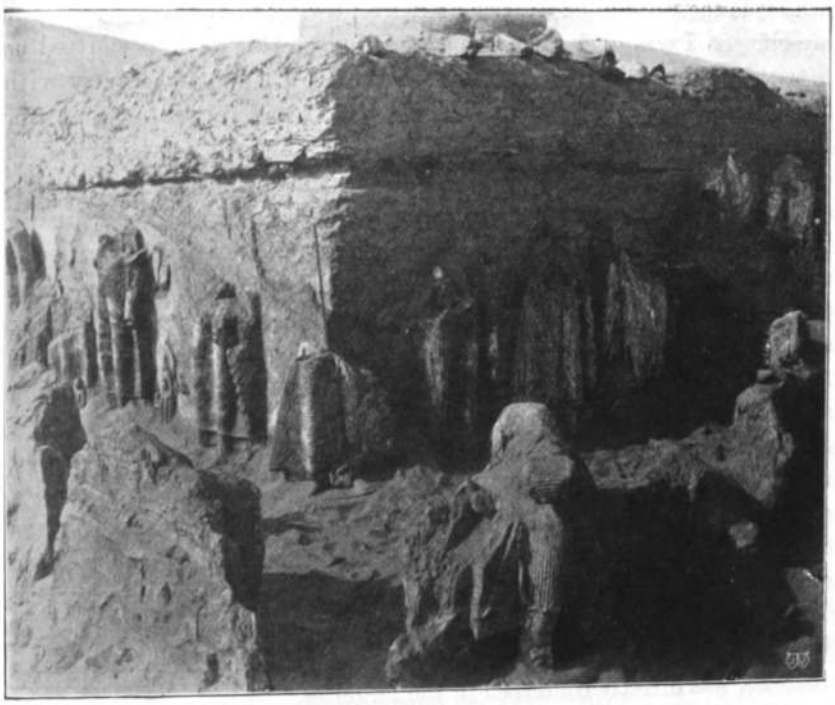

FIG. 11.—RELIEVOS AT OUTER S.E. CORNER OF QUADRANGLE OF RAWAK STUPA COURT.

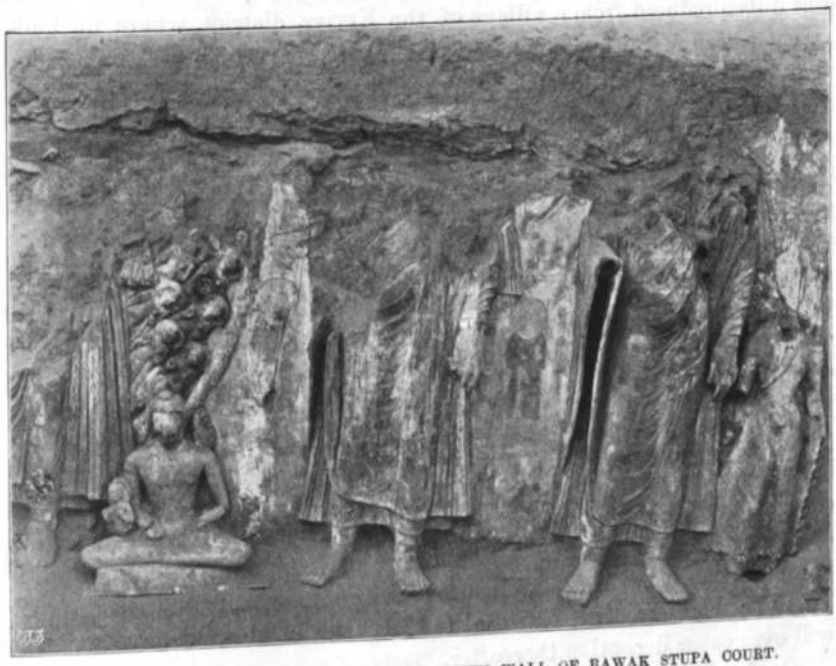

FIG. 12.—COLOSSAL STATUES ON INNER SOUTH WALL OF RAWAK STUPA COURT.

The daily sand-storms, together with the increasing heat and glare, had made the work of excavation at Rawak trying to the men as well as myself. So I was glad when the completion of this task permitted us to withdraw from the desert. On my return to Khotan I was busy with arranging my collections of archæological finds and repacking them for their long journey to London. While thus engaged I succeeded in clearing up the last doubts as to the real nature of the strange manuscripts and "block-prints" "in unknown characters" which had, during recent years, been purchased from Khotan in such remarkable numbers, and which had found their way not only to Calcutta, but also to great public collections in London, Paris, and St. Petersburg. The grave suspicions which my previous inquiries had led me to entertain as to the genuineness of these supposed "finds" had gradually been strengthened almost to certainty by the explorations of the winter. Ample and varied as the manuscript materials had been which rewarded my excavations, I had utterly failed to trace the smallest scrap of writing in "unknown characters." The actual conditions of the sites explored also entirely differed from the conditions under which those queer manuscripts and prints were alleged to have been discovered. There was good reason to believe that Islam Akhun, a native of Khotan, from whom most of those purchases had been made during the years 1895–98, was directly concerned in the forgeries.

After my return to Khotan I expressed to Pan-Darin a wish for a personal examination of this interesting individual. Some days later he was duly produced from a village of the Keriya district, where he had recently been practising as a "medicine man." Islam Akhun's examination proved a lengthy affair. He readily acknowledged his guilt in various recent frauds (including one practised on Captain Deasy), for which he had received due punishment from local Chinese justice. But in the matter of the "old books" he at first protested complete innocence. His defence, however, collapsed in the course of a prolonged cross-examination, and ultimately he made a full confession. The detailed explanations he then furnished of the circumstances which had first led to the conception of these forgeries, and of the methods and materials employed in their manufacture, were interesting enough, and proved, on comparison with the record which had been kept at Kashgar of the purchases, remarkably accurate. Notwithstanding the ingenuity displayed in starting these forgeries, Islam Akhun and his factory "hands" had never succeeded in producing a text exhibiting consecutively the characters of any known script. Also in other material respects it is easy now, in the light of the experience gained through my explorations, to distinguish between his fabrications and genuine ancient manuscripts. There is, therefore, little fear that the forgeries of this clever scoundrel will ever cause deception thereafter.

On April 28 I bade farewell to Khotan town, and May 12 saw me

once more at Kashgar under the hospitable roof of my friend Mr. Macartney, the British representative. Since my departure, eight months earlier, Mr. Macartney had lost no opportunity to facilitate my labours. The assistance of the Chinese officials, which was essential for the success of my explorations, had been secured mainly through his influence and unfailing care. For all the help thus accorded to me I wish to express here my feelings of sincere gratitude.

The Government of India had obtained for me permission to travel through Russian-Turkestan on my way to Europe, while Sub-surveyor Ram Singh, the faithful companion of my journey, was to return to India. He had rendered excellent service in accurately surveying the whole of the ground covered by my travels, and had at all times cheerfully borne the fatigue inseparable from rapid marching over difficult ground and from work under trying climatic conditions.

I had been authorized by the Indian Government to convey the whole of my archæological collections to London, and was hence especially concerned about satisfactory arrangements for my onward journey through Russian territory. These arrangements were greatly facilitated by M. Petrovsky, Imperial Russian Consul-General at Kashgar, whose acquaintance I was fortunate enough to make on this occasion. Himself a scholar thoroughly interested in the study of Turkestan history and antiquities, M. Petrovsky did all in his power to assure the safe transit of my collections and to secure for me the friendly assistance of the Russian authorities.

On May 29, 1901, just a year after leaving Srinagar, I started from Kashgar with my antiquities packed in twelve large boxes. There was a great deal of snow still on the Alai passes, but we crossed them without mishap. After having been very kindly received at Osh by Colonel Zaytzeff, the chief of the district, I reached at Andijan the terminus of the Transcaspian railway. By it I travelled to Krasnovodsk, making short halts at Margelan and Samarkand, where much kind attention was shown to me by the provincial governors. From Krasnovodsk I crossed to Baku, and finally, on July 2, I arrived in London, where I had the satisfaction of depositing the antiquities unearthed from the desert sands in the British Museum as a safe temporary resting-place. Neither they nor my eight hundred odd photographic negatives on glass had suffered by the long journey.

The twelve weeks of special duty allowed to me in London barely sufficed for the rough arrangement of my collection and the preparation of a Preliminary Report,* though, in regard to the former task, I enjoyed the benefit of the expert help of my friend, Mr. F. H. Andrews, late Principal of the Lahore School of Art.

* 'Preliminary Report on a Journey of Archæological and Topographical Exploration in Chinese Turkestan.' Published under the authority of H.M.'s Secretary of State for India. 71 pp., quarto, with 16 plates and 13 photographs. London, 1901.

After my return to India heavy official duties as Inspector of Schools in the Punjab left me no time whatsoever for scientific work. The Government of India, however, have since generously accorded to me a period of eight months' deputation in England, and with the temporary leisure thus assured to me I am now endeavouring to prepare a detailed Report, which is to render the results of my journey fully accessible for further researches.

Before the reading of the paper, the PRESIDENT said: The communication we have to receive this evening is from Dr. Stein, who was appointed by the Government of India to explore a portion of Chinese Turkestan. I think I may promise you that the paper will remind you of the days of Sir Henry Rawlinson and Sir Henry Yule. I will now ask Dr. Stein to read his paper.

After the reading of the paper, the PRESIDENT said: I think there is a debt that we owe, before referring to the valuable paper that has been read to us, to the Government of India. We are bound at this meeting to express our sense of the liberality and the public spirit which has led the Government of India to give such encouragement and assistance to the investigations of Dr. Stein. I do not think we shall be far wrong if we attribute that impulse of public spirit in this direction to our associate Lord Curzon, the Viceroy of India. It was very pleasant, also, to hear of the great assistance which was given to Dr. Stein at Kashgar by Mr. Macartney and by the Russian Consul-General, and above all it was very pleasing to us to know that the Chinese authorities throughout this great region are not only glad to help our travellers, but take an intelligent interest in the work they are doing. With regard to Dr. Stein himself, I think we must have all been impressed with the value, in the first place, of his geographical work, both on the road to Kashgar and to the south of Khotan, where he appears to have executed very valuable surveys, having been able to connect his work with several trigonometrical points of the Indian Survey. It would be almost impossible to exaggerate the great value and importance of his archæological and historical investigations, and for us as geographers it shows, in the first place, the great importance of a traveller having been thoroughly trained for the work he undertakes, for we can see from the paper that Dr. Stein had at his fingers' ends the records of Hiuen Tsiang and the other Chinese pilgrims of more than a thousand years ago, as well as almost everything else that has been written upon the subject of this region. He thus went to the country ripe for the work he had before him, and he has done his work very thoroughly and under very great difficulties. As geographers, we see how important these historical and archæological investigations are to our science; Mr. Vaughan Cornish would have been deeply interested, if he had been here, in discussing the real causes of the encroachment of sand upon civilized regions to the north of Khotan. It must be evident that once there was a very large population there, and I understand from Dr. Stein that it is his opinion that the ruin was due more probably to the falling off of the population and consequent neglect of irrigation works than to any of the forces of nature. If that be the case, there is in the future, as there was in the past, the possibility of a great and fertile irrigated region taking the place of the desert. All these points are suggested by the most interesting paper of Dr. Stein, and I scarcely ever remember listening to a paper which was so thoroughly well illustrated by excellent photographs. I feel sure that we all desire to pass a very cordial vote of thanks to Dr. Stein for his communication.

PRINTED BY WILLIAM CLOWES AND SONS, LIMITED, LONDON AND BECCLES.

MAP SHOWING PORTIONS OF
CHINESE TURKESTAN

Surveyed under the direction, and with the assistance, of

M. A. STEIN, Ph.D.,

H.M's Indian Educational Service,

By Sub-Surveyor S_____ R_____,

Survey of India Department,

1900-1901.

From the Map on the Scale of 1 : 760,000, published by the Surveyor General of India.

SCALE OF MILES

0 10 20 30 40 50 60 70 80 90 100

Natural Scale 1 : 1,500,000 or 23·67 miles to 1 inch.

Heights in feet.

Route _____ *Ancient Sites* . KARADONG

Newly triangulated points . . . △ 12000

Survey „ „ . . . △ 17000

PORTIONS OF KHOTAN OASIS

Scale of Miles. 0 1 2 3 4 5

Nat. Scale 1:250,000 or 3·9 miles = 1 inch.

TAKLAMAKAN DESERT

KASHGARIA

KARAKASH

YURUNGKASH

KHOTAN (ILCHI)

YARKAND

KARGHALIK

KARADONG

KERIYA R.

KERIYA

KHOTAN

YOTKAN

KARAKASH

KASHGAR

YARKAND

KARGHALIK

KARADONG

KERIYA

KHOTAN

YOTKAN

KARAKASH

TAKLAMAKAN DESERT

PORTIONS OF KHOTAN OASIS

Scale of Miles.
0 1 2 3 4 5
Nat. Scale 1:250,000 or 3·9 miles = 1 inch.

PORTIONS OF URKESTAN

and with the assistance, of
IN, Ph. D.,
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_____ R _____,
Department,
901.

l : 760,000, published by the
ral of India.

MILES
60 70 80 90 100
or 23·67 miles to 1 inch.
feet.

les . KARADONG
▲ 12000
△ 17000
9760

Scale of Miles.
0 100 200 300
Nat. Scale 1:20,000,000 or 316 m. = 1 inch.

KHOTAN (ILCHI)
YOTKAN
YOTKAN
KARAKASH
KHOTAN
KARAKASH
KHOTAN
KARADONG 3830
KERIYA
KERIYA
KERIYA

77 78 79 80 81 82 83 84

40 39 38 37

PORTIONS OF KHOTAN OASIS

Scale of Miles.
0 1 2 3 4 5
Nat. Scale 1:250,000 or 3·9 miles = 1 inch.

Karakash
Jaglaga
Kayesh
Yangi-arik
Imam-hasim M.
Suya
AKSIPIL RUINS
KIGHILLIK
TATI
Kumchakar
Khanarik
Loika
Lasku
Gul Bagh
Baghrak
Ak-sarai
Tasmache
Koshkol
Yokakun
Shoma
Bizin
Arik-kente
Baghche
Borazan-bazar
Givos
Nar-bagh
KHOTAN (ILCHI)
TAM-OGHIL
Somaya
Chalbash
KOTKAN
Kum-i-shamdam
Kashe
Halalbagh
Aiding-kul
Yurungkash
Bowa-kambar M.
Nagara-khana
Gujan
Sula
Tamasha
Bosak
Potakla
Jalalbagh
Koziya
Jai
Kacha
Chajele
Ak-sarai
Kalvara
Kosa
Sipsia
Kochuluk
Budia
Chakesh
Jamada
Tozakche
Chalmia
Kara-kash R.
Yangi-darya
ZAWA KARAKASH
SIPA BORAZAN
LASKA TOSALLA
JIYA YURUNGKASH
Yurung-kash R.
Laska-ustang

TAKLAMAKAN DESERT

PORTIONS OF TURKESTAN

irection, and with the assistance, of

STEIN, Ph. D.,

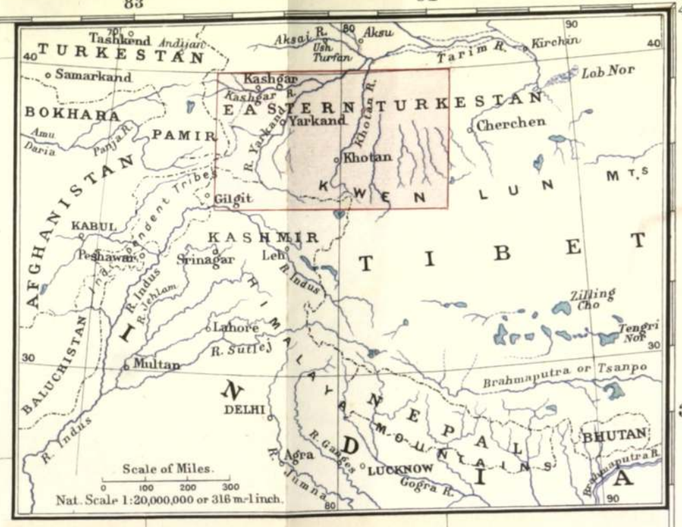
an Educational Service,

yor S_____ R_____,

of India Department,

1900-1901

YARKAND
Yangi Shahr
Zaraf-shan or Yarkand R.
Jilkaucha
Tugulaz
Charvak (Sishamba Bazar)
Karghalik
Yalghuzbagh
Shot Ustang
Minkatning Sepi
Jallat Kum
Cholak Langar
Kokkir
Sitigh Langar
Cuma Bazar
Kishlak
Tazgun R.
Sughayar
Baghli
KARSHAL TATI
TOGUJAI
KULLANGAR
KARAKIR TIM
KARADOBE
Belkum
Sai Langar
Duwa Bagan
Piyalma
Karakash
AKSIPIL (Ruined Fort)
ARKA KUDUK TIM
UZUNTATI
OLD FORT
Lachinata M.
Panak
Bostang
Achma
Shivul
Keriya
4550
Arai
Keriya R.
Toldama (pools)
Yoghan-Kum
Tuga-taidi
Jazkorghan Yailak
Bilangan
Kumbarawat Yailak
Mulla-gadai
Misalai-Oghil
Ochke-ulus Oghil
Gharib Chakma
RAWAK
DANDAN-UILUK RUINS
Karadong
Takagh Oghil
Chigit Korghan
Petal Oghil
Dong Satma
Burhanuddin M.
4360
Kenk-kiok
Bulak
Yoghan-toghrak
Karakumash Oghil
Swamp
Shakian Yailak
Kara-kurun
Baghaigde
Hassanatun
Arish Mazar
Low Sand Dunes
To Kapa
Yesyulghun
Orraz
Stony Sai
Surghak (Gold Mines)
KARADONG 3830
Old river bed
Yanguz-baste
Dry River Bed
Yailak
Chal Oghil
Kizil Oghil
Aptab Oghil
Kochkar Oghil
Basuk Oghil
Chokan Jilga
Koh Satma
Low Sand Dunes with scrub
Otur Misil
Islamabad
Atbashi
Butuboine
Kalama
Hong
Tawakel
Yamalak-toghrak
Otoro
JUMBE KUM
RAWAK VIHARA
Achikul
Jaituvek
Takhtuwen
Tarbugaz
Kumrabad
Padshahim M. (well)
Zawa-Kurghan
Imam-Aptar M.
Yuran
Hanguya
Bazar
Ak-sarai
Ujat
Costinga
Pujia
Popurun
Uzunaral
Ak Langar
Toghrakalu
Ak Langar Tim
Gulabkhana
Achma
Bostang
Shivul
Ak-sarai
Ab-ab
Ab-ab L.
Springs
Yangi Aksu Ustang
Satma Langar
Chira R.
Kumbagh
Pondok
Uz-toghrak
Ara Ustang
Kara-kash R.
Kara-kash Sa.
Tosalla
Besht-eghrak
Esbagh L.
Esbagh
Bazmalik-Jamat
Khushbojilak
Tashlikboyan
Kumat
Yarai L.
Nazik L.
Kumat-agzi
Kumat Dawan
Yagan-agzi
Terekli Kishlak
Terekli
Yurungkash R.
Chokan Jilga
Koh Satma
Low Sand Dunes
Otur Misil
Islamabad
Atbashi
Butuboine
Kalama
Hong
Tawakel
Yamalak-toghrak
Otoro
JUMBE KUM
RAWAK VIHARA
Achikul
Jaituvek
Takhtuwen
Tarbugaz
Kumrabad
Padshahim M. (well)
Zawa-Kurghan
Imam-Aptar M.
Yuran
Hanguya
Bazar
Ak-sarai
Ujat
Costinga
Pujia
Popurun
Uzunaral
Ak Langar
Toghrakalu
Ak Langar Tim
Gulabkhana
Achma
Bostang
Shivul
Ab-ab
Ab-ab L.
Springs
Yangi Aksu Ustang
Satma Langar
Chira R.
Kumbagh
Pondok
Uz-toghrak
Ara Ustang
Kara-kash R.
Kara-kash Sa.
Tosalla
Besht-eghrak
Esbagh L.
Esbagh
Bazmalik-Jamat
Khushbojilak
Tashlikboyan
Kumat
Yarai L.
Nazik L.
Kumat-agzi
Kumat Dawan
Yagan-agzi
Terekli Kishlak
Terekli
Yurungkash R.
Kizil Kurun
Keriya R.
Niya R.
Niya
Tempe
Sarigh
To Kapa
Low Sand Dunes
Surghak (Gold Mines)
Bostan-Toghrak Endere Drainage
Old river bed
New Channel
Old river channel
Recent river cracks
Yartunghaz Tarim
Study stream
Dry river bed
Karadong Oghil
Endere Tarim (abandoned colony)
ANCIENT SITE
STUPA
Kirilik
Ziarat
Yantak Chaval
Kala-sulaghi
Sizutke Kol
Tulkuch Kol
Irik-aghiz
Imam Jafar Sadik Mazar
Teret Langar
Shapang
Dabza (Dead forest)
Alguje-olgan
Helyabeg
Korgach
RUINED STUPA
ENDERE RUINS
Tokuska
To Cherchen
Endere R.
Kuyek Oghil
Haidil Shah-kiri (well)
Yoke-toghrak
Old Bed
Cholak Oghil
Otra Langar
Musabegim Langari
Nagara-khana
Yoghan-toghrak
Tarning Bulaki Sp.
Tuzluk Kum
Bulaklik L.
Sizutke L.
Yartungaz R.
Dong Oghil
Springs
Kum-chaklik
Kalla Kerin
Springs
Shitala Padshahim M.
Swamp
Gilem Kul (marsh)
Kalmak-kuduk
Low Sand Dunes
To Kapa
Yesyulghun
Orraz L.
Surghak (Gold Mines)
Bostan-Toghrak Endere Drainage



TAKLAMAKAN DESERT

SHOWING PORTIONS OF

SE TURKESTAN

er the direction, and with the assistance, of

A. STEIN, Ph.D.,

Ms Indian Educational Service,

Surveyor S_____ R_____,

Survey of India Department,

1900-1901.

on the Scale of 1 : 760,000, published by the Surveyor General of India.

SCALE OF MILES

40 50 60 70 80 90 100

ale 1 : 1,500,000 or 23·67 miles to 1 inch.

Heights in feet.

— *Ancient Sites* . KARADONG

ated points . . . △ 12000

" . . . △ 17000

. . . . . *9760*

. . . . . *Dark Green.*

h scrub or jungle . *Light Green.*

. . . . . *Yellow.*

ey	Lr. Langar. Rest House
ch Station	M. Mazar . Tomb
e	Oghil. . . Shepherds Station
dhill	Tagh . . . Hill, Peak
	Ustang . . Canal

PORTIONS OF
KHOTAN OASIS

Scale of Miles.
0 1 2 3 4 5

Nat. Scale 1:250,000 or 3·9 miles = 1 inch.

Scale of Miles.
0 100 200 300

Nat. Scale 1:20,000,000 or 316 m. = 1 inch.

77 78 79 80 81 82 83 8

Published by the Royal Geographical Society.

TAKLAMAKAN DESERT

PORTIONS OF KHOTAN OASIS

Scale of Miles.
0 1 2 3 4 5
Nat. Scale 1:250,000 or 3·9 miles = 1 inch.

Kara-kash R. · Yangi-arik · Kum-i-shahidan · Kashe · Halalbagh · Bowa-kambar M. · Ngara-khana · Aiding-kul · Towen-gujan · Yurungkash · Sula · Gujan · Tamasha · Potakla · Jalalbash · Koziya · Bosak · Jai · Kachin · Chajele · Ak-sarai · Kalvara · Kosa · Sipsia · Jamada · Kochuluk · Budia · Chakesh · Tozakche · TATI · Chalmia · BOSTAN TOSLA · YURUNGKASH

PORTIONS OF TURKESTAN

Published with the assistance, of
[illegible], Ph. D.,
[illegible] Service,
[illegible] R [illegible],
[illegible] partment,
[illegible].
60,000, published by the
of India.
MILES
60 70 80 90 100
3·67 miles to 1 inch.
[illegible].

KARADONG
[illegible] 12000
[illegible] 17000
9760
[illegible] Dark Green.
[illegible] Light Green.
[illegible] Yellow.

[illegible] Langar . Rest House
[illegible] Mazar . Tomb
[illegible]. . . Shepherds Station
[illegible]. . . Hill, Peak
[illegible] . . Canal

YARKAND · Yangi Shahr · Tegechak Langar · Karakam · Bigil · Tashtaku · Akhtala · Otanchilik · Achma · Punap (Ferry) · Posgam · Chamgurche (Shamba Bazar) · Kok-jigde · Tugulaz · Tanaf R. · Karchir · Karghalik · Derme · Bayin · Kumbagh · Yalghuzbagh · Besh-arik · Akin I. · Shot Ustang · Odobagh · Minkatning Sary · Bustang · Ippighe · Kosh Langar · Jallat Kum · Cholak Langar · Kokkir · Sibigh Langar · Cuma Bazar · Karatagh-aghzi · Karakul M. · Bajibi · Otrada · Kishlakoul · Mokaula · Yangi-arik · KARSHAL TATI · Tazgun R. · Chuddan · TOGUJAI · Sughaiyar · Tilbashi-khan · Saibagh · Baghle · KULLANGAR · KARAKIR TIM · From Sanju · Belkum · Sai Langar · KARADOBE · Dura · Takhtawen L. · Kutash · Tarbugaz · Kumrabat · Padshahim M. (well) · Zawa-Kurghan · Imam-Aptar M. · Aksaru · Ujat · TATI · Uzunaral · Achik · Topuna · Pujia · Kaparlik R. · Kaparlik Kez · Kunat-aghzi · Kunat Dawan · Yaman-aghzi · Yaman Dawan · Brinjak P. · Chahkol Ph. · Mudache Tagh · Nissa · Pamtagh P. · Kashgar Tagh · Tizlash · Piska · Igan Dawan · Ulan · Kerik-bulak · Yurungkash R. · Chokan Jilga · Kosh Satma · Low Sand Dunes with scrub · Otur Misil · Islamabad · Atbashi · Butukaine · Kalama · Hong · Tawak R. · Yamalak-toghrak · Otoro · JUMBE KUM · RAWAK VIHARA · Yawa · Achik-su · Shabkilik Ustang · Karakash R. · Karakash · Sipa · Taskan · AKSIPIL (Ruined Fort) · ARKA KUDUK TIM · KHOTAN · Hanguya · Yop Bazar · Sanjula · Beshtoghrak · Sprouts · Ak Langar · Siyawushan · Eshpe · Ridehahim · Akin · Toghrakbulak · Ak Langar · Ujat · Ruzmalik-kumat · Khushbulak · Tashlikboyan · Kumat · Yaman · Nazik · Yurungkash R. · Kara-kash R. · Yurungkash R. · Kosh Langar · Low Sand Dunes · Yurungkash R. · Tawak R. · Kiziltash · Tamekaishak · Mazar · Genia R. · Khungar R. · Khungar Pass · Utrala Gl. · Muztagh (K2) · Yakputaran Pk. · Chelpanglik Muztagh · Yurungkash R. · UZUNTATI · OLD FORT · Supuji M. · Karakumush Oghil · Swamp · Shakan Yailak · Lachinata M. · Yoghan-toghrak · Kara-Murun · Baghaude · Hassanatun · Panak · Malakalagan · Arish Mazar · Bostang · Achma · Shivul · Keriya R. · Kiziltash · Ulughat · Yolchin M. · Achma · Nura · Imamla · Saibagh · Badaghan · Chanda Doha · Eski Yama · Kohodang · Yurungkash R. · KARADONG 3830 · Toldama (pools) · Tonguz-baste · Yoghan-Kum · Old river bed · Dry River Bed · Duruilga Yailak · Keriya R. · Tuga-taidi · Jazkorghan Yailak · Bilangan · Kumbarawat Yailak · Mulla-gadai · Misalai-Oghil · Ochke-ulus Oghil · Gharib Chakma · RAWAK · Kiak Chakma · Kiuk Oghil · DANDAN-UIUK RUINS · Bazuk Oghil · Aptab Oghil · Karadong · Takmak Oghil · Kochkar Oghil · 4090 · Chigit Korghan · Petal Oghil · Dong Satma · Burhanuddin M. 4360 · Kenk-kiok · Bulak · Keriya R. · Kiziltash · Chal Oghil · Keriya R. · Niya R. · Surghak (Gold Mines) · Bostan-Toghrak Endere Drainage · Stony Sai · Ara Ustang · Ui-toghrak · Aral · Kumbagh · Yanda · Pandra · Satma Langar · Springs · Nasik Akin Ustang · Chira Bulghakma · Toghrakbulak · Ab Ab L. · Eshpe L. · Akin L. · Ak Langar · Siyawushan · Ridehahim · Sprouts · Beshtoghrak · Ruzmalik-kumat · Khushbulak · Tashlikboyan · Kumat · Yaman L. · Nazik · Yurungkash R. · Kara-kash R. · Yurungkash R. · Kosh Langar · Low Sand Dunes · Yurungkash R. · Tawak R. · Kiziltash · Tamekaishak · Mazar · Genia R. · Khungar R. · Khungar Pass · Utrala Gl. · Muztagh (K2) · Yakputaran Pk. · Chelpanglik Muztagh · Yurungkash R. · Keriya R. · Niya R. · Surghak (Gold Mines) · Bostan-Toghrak Endere Drainage · Stony Sai · Ara Ustang · Ui-toghrak · Aral · Kumbagh · Yanda · Pandra · Satma Langar · Springs · Nasik Akin Ustang · Chira Bulghakma · Toghrakbulak · Ab Ab L. · Eshpe L. · Akin L. · Ak Langar · Siyawushan · Ridehahim · Sprouts · Beshtoghrak · Ruzmalik-kumat · Khushbulak · Tashlikboyan · Kumat · Yaman L. · Nazik · Yurungkash R. · Kara-kash R. · Yurungkash R. · Kosh Langar · Low Sand Dunes · Yurungkash R. · Tawak R. · Kiziltash · Tamekaishak · Mazar · Genia R. · Khungar R. · Khungar Pass · Utrala Gl. · Muztagh (K2) · Yakputaran Pk. · Chelpanglik Muztagh · Yurungkash R.

ANCIENT SITE · STUPA · Recent river course · Yartungaz Tarim · Dry river bed · Old river bed · New Channel · Old river Channel · Karadong · Oghil · Endere Tarim (abandoned colony) · Kizilik · Yantak · Chaval · Endere · Liarat · RUINED STUPA · ENDERE RUINS · Kala-sulaghi · Sizutke Kol · Tulkuch Kol · Imam-Jafar Sadik Mazar · Irik-aghil · Dry river bed · Korgach · Takuskol · To Cherchen · Teret Langar · Shapang · Akjuje-olgan · Helyabeg · Dabza (Dead forest) · Old river bed · Kuyek Oghil · Haidil Shah-kikri (well) · Yoka-toghrak · well · Old Bed · Cholak Oghil · Otra Langar · Bulekilik L. · Sizutke L. · Shahidan · Musabegim Langari · Dong Oghil · Springs · Nagara-khana · Yoghan-toghrak · Kum-chaklik · Kuila Kerin · Springs · Tarning Bulaki Sp. · Shitala Padshahim M. · Swamp · Tuzluk Kum · Gilem Kul (marsh) · Kalmak-kuduk · Yartungaz R. · Lempe · Sariqh · To Kapa · Yesyulghun · Low Sand Dunes · Orraz L. · Kerkarish · Bughrakum Padshahim M. · Niya R. · Surghak (Gold Mines) · Sanje L. · Tumbaz L. · Kuyek-bulak L. · Unglak Sai L. · Kuyek Sai L. · Bostan-Toghrak Endere Drainage

Scale of Miles.
0 100 200 300
Nat. Scale 1:20,000,000 or 316 m. = 1 inch.
Multan · DELHI · Agra · LUCKNOW · Gogra R. · Brahmaputra or Tsanpo · Brahmaputra R. · NEPAL · HIMALAYA MOUNTAINS · BHUTAN · BALUCHI · R. Indus · R. Jumna · R. Ganges

78 79 80 81 82 83 84
36 37 38 39

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Stanford's Geogl Estabt London.

MAP SHOWING PORTIONS OF
CHINESE TURKESTAN

Surveyed under the direction, and with the assistance, of

M. A. STEIN, Ph.D.,

H.M's Indian Educational Service,

By Sub-Surveyor S_____ R_____,

Survey of India Department,

1900-1901.

From the Map on the Scale of 1 : 760,000, published by the Surveyor General of India.

SCALE OF MILES

0 10 20 30 40 50 60 70 80 90 100

Natural Scale 1 : 1,500,000 or 23·67 miles to 1 inch.

Heights in feet.

Route ——— *Ancient Sites* . KARADONG

Newly triangulated points . . . ▲ 12000

Survey „ „ . . . △ 17000

Other heights 9760

Cultivation . . . . . *Dark Green.*

Sandy tract with scrub or jungle . *Light Green.*

Moving Sands . . . . . *Yellow.*

Dawan . Pass
J. Jilga . Valley
Lr. Langar . Rest House
M. Mazar . Tomb

PORTIONS OF KHOTAN OASIS

Scale of Miles.

0 1 2 3 4 5

Nat. Scale 1:250,000 or 3·9 miles = 1 inch.

KHOTAN (ILCHI)
TAM-OGHIL
YURUNGKASH
TOSALLA
BOSALLA
Kara-kash R.
Yangi-darya
Yurungkash R.
Keriya R.
TAKLAMAKAN DESERT
KASHGARIA
YARKAND
Karghalik
Tazgun R.
Yangi-shahr
Khotan
Keriya
Nat. Scale

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Other heights	9760
Cultivation	*Dark Green.*
Sandy tract with scrub or jungle .	*Light Green.*
Moving Sands	*Yellow.*

Dawan	. Pass	Lr. Langar	. Rest House
J. Jilga	. Valley	M. Mazar	. Tomb
Karaul	. Watch Station	Oghil. . .	. Shepherds Station
Kul	. . Lake	Tagh . .	. Hill, Peak
Kum	. . Sandhill	Ustang	. . Canal
Kurghan	. Fort		

PORTIONS OF
KHOTAN OASIS
Scale of Miles.
0 1 2 3 4 5
Nat. Scale 1:250,000 or 3·9 miles = 1 inch.

Scale of M
0 100
Nat. Scale 1:20,000,00

80 81 82